

COMPUTERFACTS™

Technical Service Data

C.ITOH®
MODELS C315P/R/XP
PRINTER



FEATURES COMPLETE SCHEMATICS • PRELIMINARY SERVICE CHECKS • TROUBLESHOOTING TIPS •
EASY-READ WAVEFORMS • REPLACEMENT PARTS LISTS • SEMICONDUCTOR CROSS-REFERENCE

PRELIMINARY SERVICE CHECKS

This data provides the user with a time-saving service tool which is designed for quick isolation and repair of Computer system malfunctions.

Check all interconnecting cables for good connection and correct hook-up before making service checks.

Always turn Printer Off before connecting or disconnecting connectors, boards or Computer.

TEST EQUIPMENT

Digital Volt/Ohm Meter

TOOLS

Phillips Screwdriver
Small Screwdriver
Soldering Iron
De-soldering Iron

REPLACEMENT PARTS AND DESCRIPTION

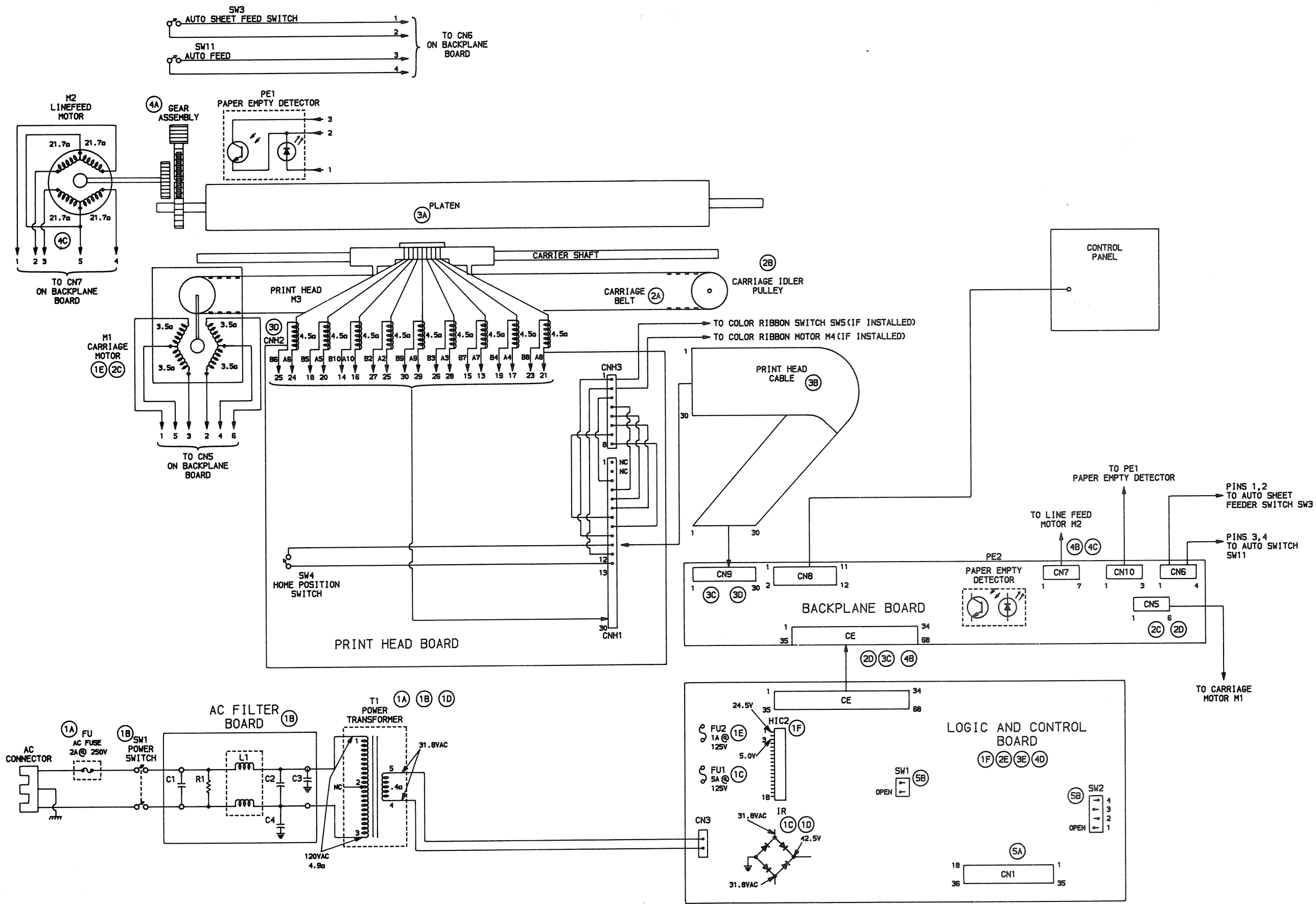
<u>Item No.</u>	<u>Part No.</u>	<u>Description</u>
IR		Bridge Rectifier
FU		AC Fuse 2 Amp @ 250V
FU1		AC Fuse 5 Amp @ 125V
FU2		DC Fuse 1 Amp @ 125V
M1		Carriage Motor
M2		Line Feed Motor
M3		Print Head
SW1		Printer Power Switch
T1	CQE61-00801 (1)	Power Transformer
	CQE61-00703 (1)	AC Filter Board
	CQE61-00306 (1)	Logic and Control Board

(1) Number on Unit

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CP46

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PRELIMINARY SERVICE CHECKS (Continued)



MODEL C315P, R, XP

INTERCONNECTING DIAGRAM

INTERCONNECTING DIAGRAM

PRELIMINARY SERVICE CHECKS (Continued)

SERVICE CHECKS

MATCH THE NUMBERS ON THE INTERCONNECTING DIAGRAM AND PHOTOS WITH THE NUMBERS ON THE SERVICE CHECKS TO BE PERFORMED.

① POWER SUPPLY

- (A) Check AC Fuse (FU). If open, check Power Transformer (T1).
- (B) Check for approximately 120V AC between pins 1 and 3 of Power Transformer (T1). If not correct, check Power Switch (SW1) and AC Filter Board.
- (C) Check Fuse (FU1). If open, check Bridge Rectifier (IR1).
- (D) Check for 31.8V AC between AC inputs of Bridge Rectifier (IR1). If not correct, check Power Transformer (T1).
- (E) Check DC Fuse (FU2). If open check Carriage Motor windings.
- (F) Check for 24.5V on pin 1 and 5.0V on pin 3 of Carriage Motor Driver (HIC2). If not correct, check Logic and Control Board by substitution.

② CARRIAGE ASSEMBLY DOES NOT MOVE

- (A) Check Carriage belt for wear.
- (B) Check Carriage idler pulley for movement.
- (C) Check Carriage Motor windings.
- (D) Check Connectors CE and CN5.
- (E) Check Logic and Control Board by substitution.

③ PRINT HEAD WILL NOT PRINT

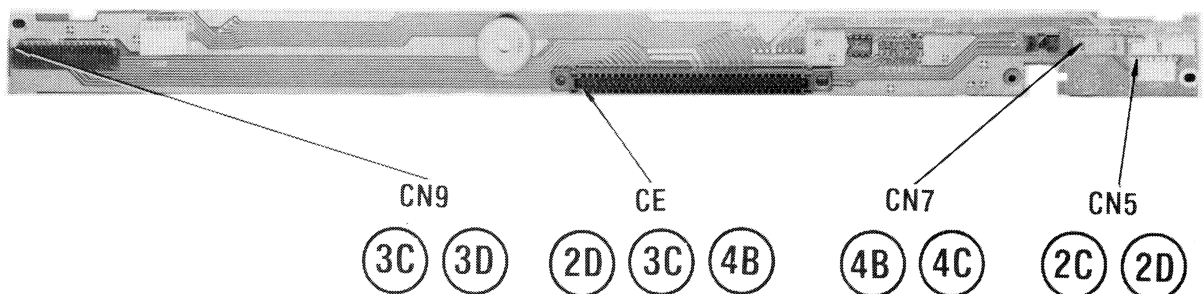
- (A) Check Print Head face for contamination.
- (B) Check Print Head Cable.
- (C) Check Connectors CE and CN9 on Backplane Board.
- (D) Check resistance readings of Print Head.
- (E) Check Logic and Control Board by substitution.

④ LINE FEED WILL NOT OPERATE

- (A) Check gear assembly for free movement.
- (B) Check Connector CE and CN7.
- (C) Check resistance of Line Feed Motor windings.
- (D) Check Logic and Control Board by substitution.

⑤ PRINTER WILL NOT ACCEPT DATA

- (A) Check CN1 and Interface cable.
- (B) Check DIP Switches for correct settings.



BACKPLANE BOARD

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PRELIMINARY SERVICE CHECKS (Continued)

DISASSEMBLY INSTRUCTIONS

NOTE: The various parts referred to in the Disassembly procedures can be located on Mechanical Photo.

CPU BOARD

Remove two screws holding back cover and remove cover. Disconnect Connector CN3 located on CPU Board. Pull CPU Board from Printer.

TOP COVER

Remove Carriage cover and paper covers from top cover. Remove two screws from rear of top cover. Release three tabs holding front of top cover to bottom cover. Disconnect Control Panel Connector and remove top cover.

PRINTER MECHANISM

Remove CPU Board. Remove top cover. Remove five screws holding Printer mechanism to bottom cover and remove Printer mechanism.

TRANSFORMER BLOCK

Remove Printer mechanism. Remove three screws holding Transformer block to bottom cover and remove Transformer block.

BOTTOM COVER

Remove Printer mechanism and Transformer block. Remove bottom shield plate. Remove bottom cover.

PRINT HEAD

Remove top covers. Position Carriage assembly so Print Head is accessible. Remove ribbon cartridge if installed. Release white plastic Print Head clamp and lift Print Head up.

PLATEN

Remove top cover and Print Head. Remove two screws holding card holder to Carriage assembly, and remove card holder. Remove platen knob and release lever from platen. Remove two screws from left and right platen plates.

Remove E-ring from tractor gear that meshes with platen gear and remove tractor gear. While holding ball roller shaft clear of platen, lift platen up and out of Printer.

PAPER FEED MOTOR

Remove Printer mechanism. Remove E-ring from auto load lever located above Paper Feed Motor and remove auto load assembly. Disconnect Connector CN7 from Backplane Board. Remove two screws holding paper feed motor from left platen frame and remove paper feed motor from Printer.

CARRIAGE MOTOR

Remove Printer mechanism. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage pulley. Disconnect Connector CN5 from Backplane Board. Remove three screws holding Carriage Motor to Printer mechanism and remove Carriage Motor from Printer.

CARRIAGE ASSEMBLY

Remove Printer mechanism. Remove two E-rings from ball roller shaft and remove ball roller shaft from Printer. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage pulley. Release ribbon wire from spring on left platen frame and secure both ends of ribbon wire to Carriage assembly so it does not unwind from ribbon pulley. Remove Carriage shaft bushings, located on each end of Carriage shaft, from slots in left and right platen frames. Disconnect Print Head cable from Connector on Print Head Board. Lift Carriage assembly up and out of Printer.

CARRIAGE BELT

Remove top cover. Remove Print Head. Remove screw holding Carriage belt clamp to Carriage assembly and remove Carriage belt clamp. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage belt pulley.

PRELIMINARY SERVICE CHECKS (Continued)

GENERAL OPERATING INSTRUCTIONS

SELF-TEST

Self-Test is initiated by pressing and holding LF (Line Feed) button or TOF (Top of Form) button while turning Printer On. Printer will continuously print until power from Printer is removed. Self-Test can be interrupted by pressing LF button and resumed by pressing On-Line button. When LF button is used to start Self-Test, Printer will print the Graphics Character Set. When TOF button is pressed, Printer will print the Standard Character Set.

SET-UP MODE

Set-Up Mode is used to select Printer's programmable functions. Functions will remain set until reprogrammed. Pressing and holding the LQ (Letter Quality) button while turning Printer On will activate Set-Up Mode and print out the first five functions, menu and status numbers. Pressing and holding On-Line and LQ button while turning Printer On will activate Set-Up Mode and print out all available functions, menu and status numbers. All indicators will be Off except the LQ lamp which will be blinking.

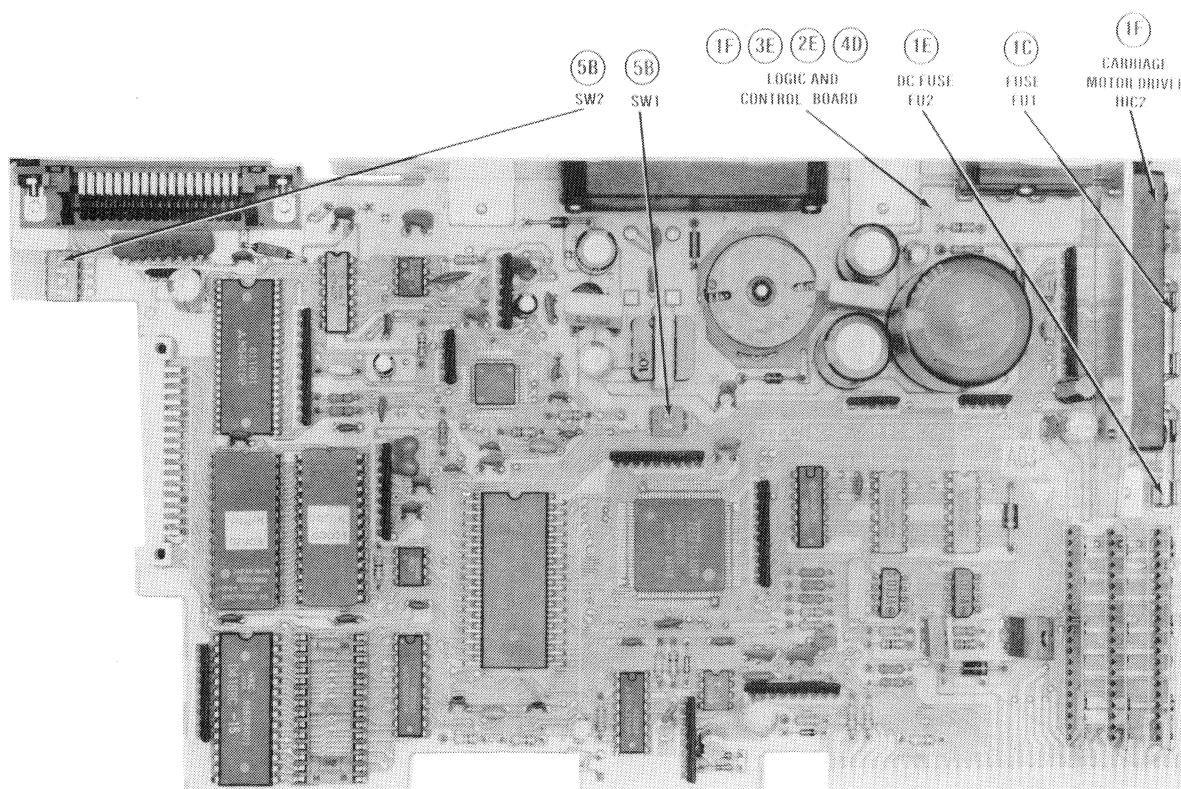
SET-UP MODE BUTTON FUNCTIONS

LQ Button: When pressed while On-Line lamp is blinking, turns Off On-Line lamp and LQ lamp begins blinking. Printer in Function Set-Up Mode. When pressed while LQ lamp is blinking, stores selected function settings into memory and exits Set-Up Mode.

On-Line Button: When pressed while LQ lamp is blinking turns Off LQ lamp and On-Line lamp begins blinking. Printer in Menu Set-Up Mode.

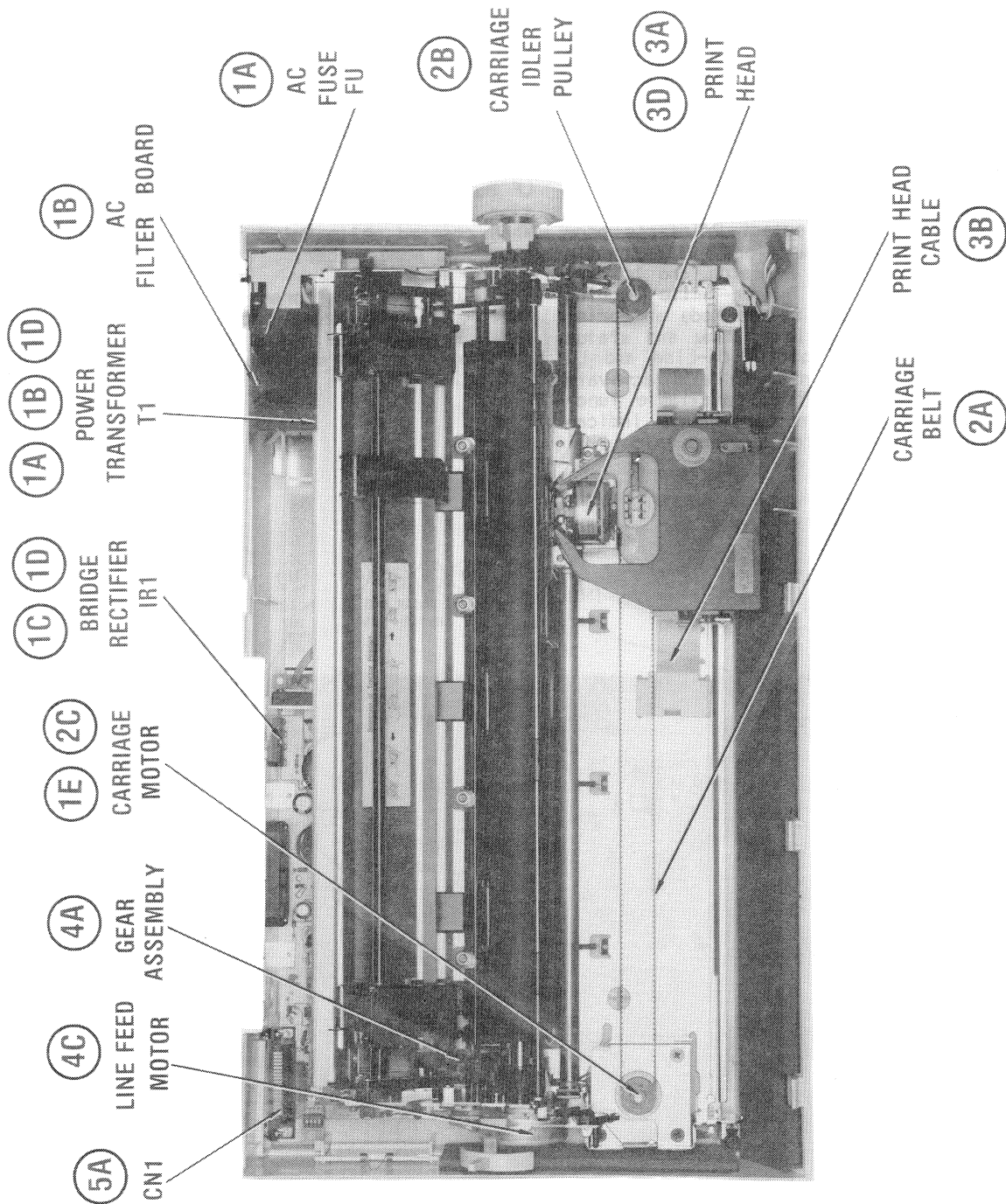
LF Button: When pressed while Printer in Function Set-Up Mode, increases function number. When pressed while Printer in Menu Set-Up Mode increases menu number.

TOF Button: When pressed while Printer in Function Set-Up Mode, decreases function number. When pressed while Printer in Menu Set-Up Mode, decreases menu number.



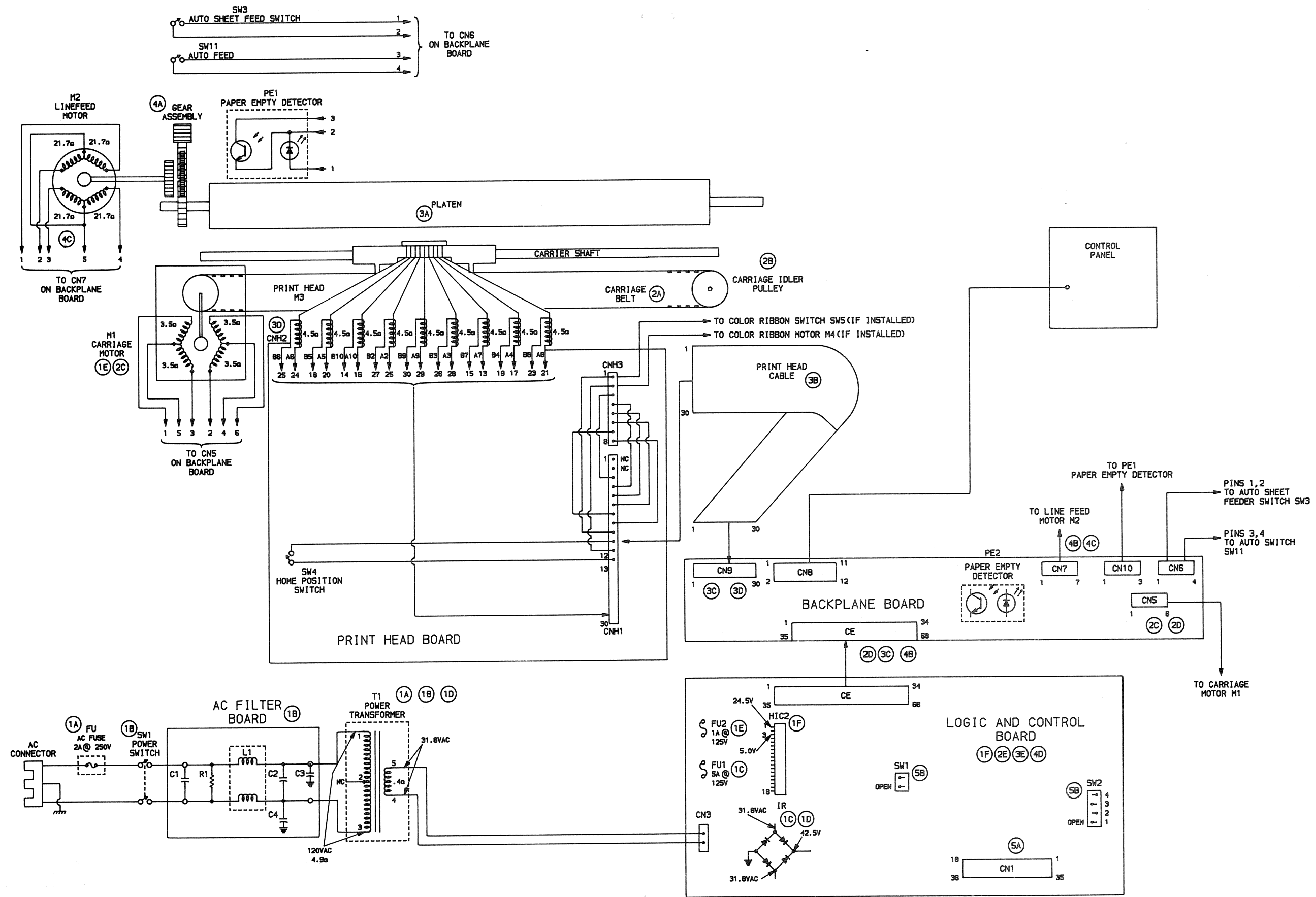
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PRELIMINARY SERVICE CHECKS (Continued)



CHASSIS-OVERALL VIEW

PRELIMINARY SERVICE CHECKS (Continued)



MODEL C315P, R, XP

PRELIMINARY SERVICE CHECKS (Continued)

PREVENTATIVE MAINTENANCE

ENVIRONMENT

Computers perform best in a clean, cool area that is below 80 degrees Fahrenheit and free of dust and smoke particles. Even though home Computers are not affected by cigarette smoke as much as commercial Computers are affected, it is better to maintain a smoke-free area around the Computer. Do not block cabinet vents of Computer, Monitor, Printer, or other power devices.

ELECTRICAL POWER

Variations in the line voltage can affect the Computer. Try to avoid these fluctuations by using an AC receptacle that is on a power line not used by appliances or other heavy current demand devices. A power-surge protector, power-line conditioner, or non-interruptible power supply may be needed to cure the problem. **Do not** switch power On and Off frequently.

KEYBOARD

Liquids spilled into the Keyboard can ruin it. Immediately after a spill occurs, disconnect the Computer power plug from AC power outlet. Then, if circuitry or contacts are contaminated, disassemble the Keyboard and carefully rinse the Keyboard printed circuit board with distilled water and let it dry. Use a cotton swab to clean between the keys. Use a non-abrasive contact cleaner and lint-free wipers on accessible connectors and contacts.

DISK DRIVES

Clean the read/write heads of the Disk Drives about once a month or after 100 hours usage. Use only an approved head cleaning kit.

Handle carefully to preserve proper disk head alignment. A sudden bump or jolt to the Disk Drives can knock the disk head out of alignment. If Disk Drive must be transported, place an old disk in slot and close door during transport.

Store disks in their protective covers and never touch the disk surface. Observe the disk handling precautions usually found on the back of disk protective covers.

PRINTERS

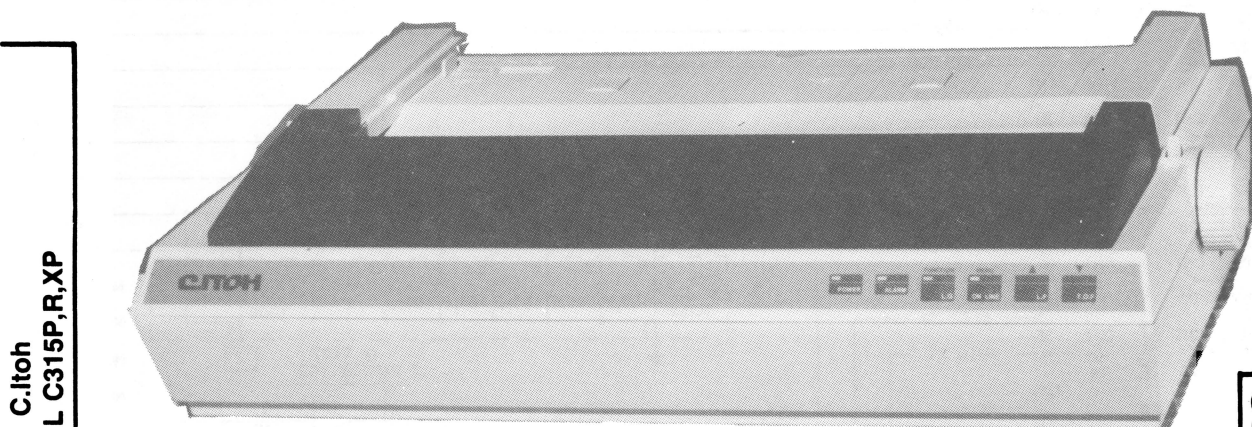
Carefully vacuum the Printer regularly. Wipe surface areas clean using a light all-purpose cleaner. Do not oil the machine. The oil will collect abrasive grit and dust. The dust will act as a blanket. This can cause components to overheat and fail.

STATIC ELECTRICITY

Static electricity discharge can affect the Computer. In order to minimize the possibility, use anti-static mats, sprays, tools and materials, and maintain good humidity in the Computer environment.

MONITOR

Use an isolation transformer with any Monitor that does not come as part of the system since some Monitors use a HOT chassis (chassis connected to one side of the AC line). The face of the Monitor should never be left on for long period of time at high brightness level except when pattern is being changed periodically. Use caution when cleaning anti-glare screens, to preserve the glare-reduction feature.



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SAFETY PRECAUTIONS

See Page 17

PRELIMINARY SERVICE CHECKS

ENCLOSED

INDEX

	Page		Page
Block Diagram	41	Photos	
Disassembly Instructions	9	Ac Input Board	42
Exploded Views	25,27,29,32,35	Backplane Board	9
General Operating Instructions..	10,11	Chassis-Overall View	18,19
GridTrace Location Guide		Logic and Control Board ..	6,8,37,39
Logic and Control Board	7	Safety Precautions	17
IC Pinouts and Terminal Guides ..	5,40	Schematics	2,3,4,42 thru 45
Line Definitions	17	Schematic Notes	16
Logic Charts	14,15	Test Equipment	12
Miscellaneous Adjustments	13	Troubleshooting	12,13
Parts List	20 thru 24,26,28, 30,31,33,34,36,38		

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co. as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co. by the manufacturers of the particular type of replacement part listed. **88CP19054** **DATE 12-88**

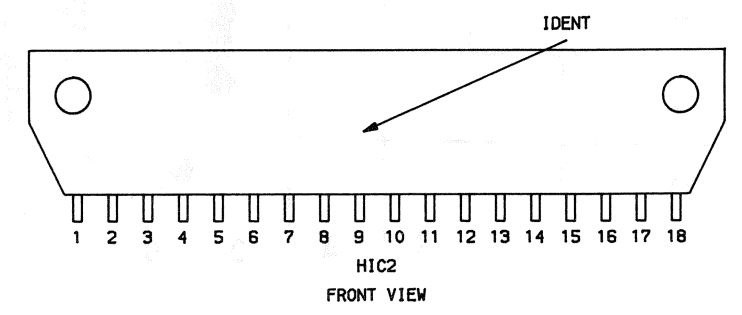
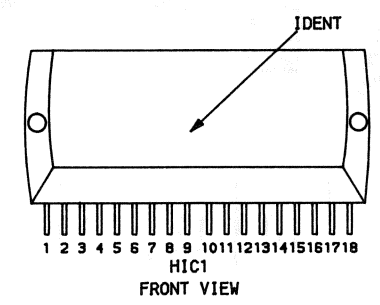
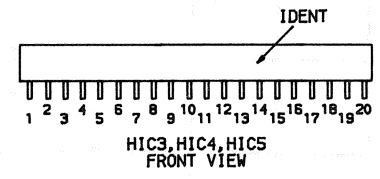
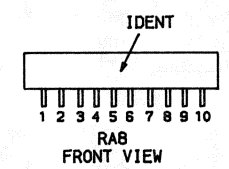
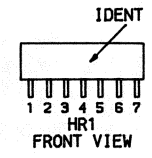
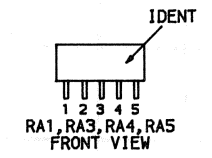
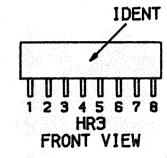
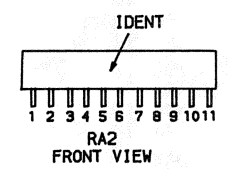
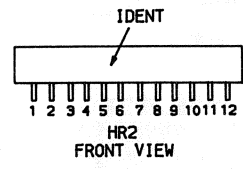
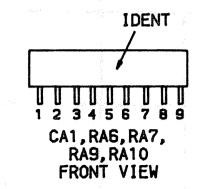
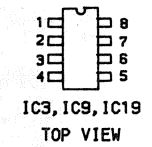
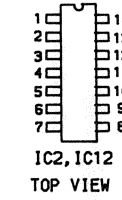
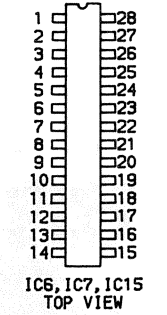
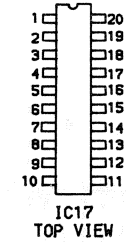
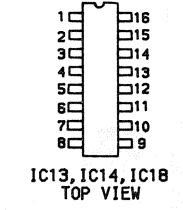
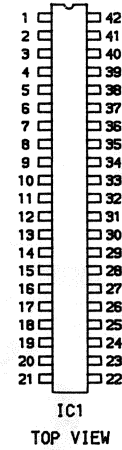
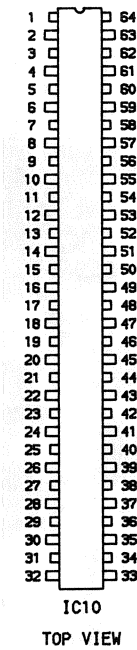
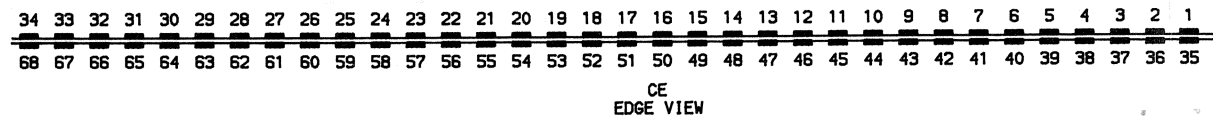
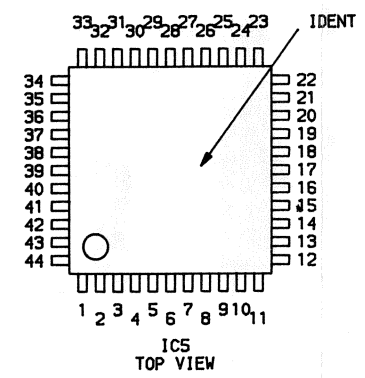
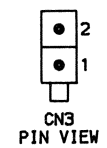
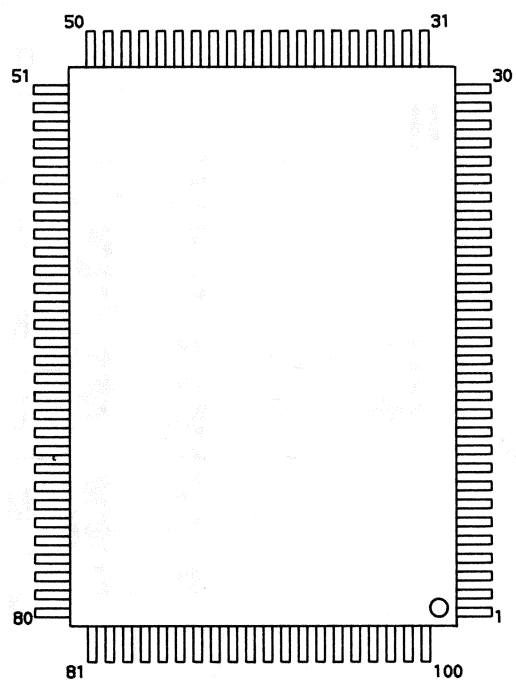
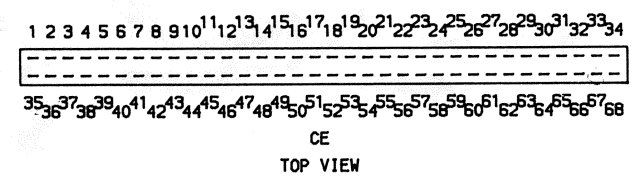
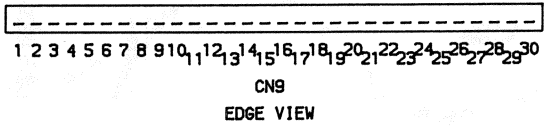
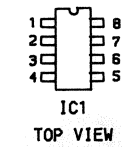
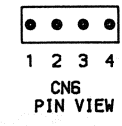
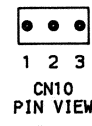
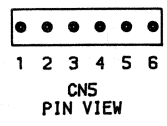
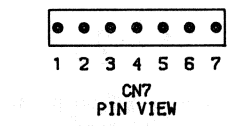
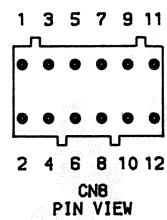
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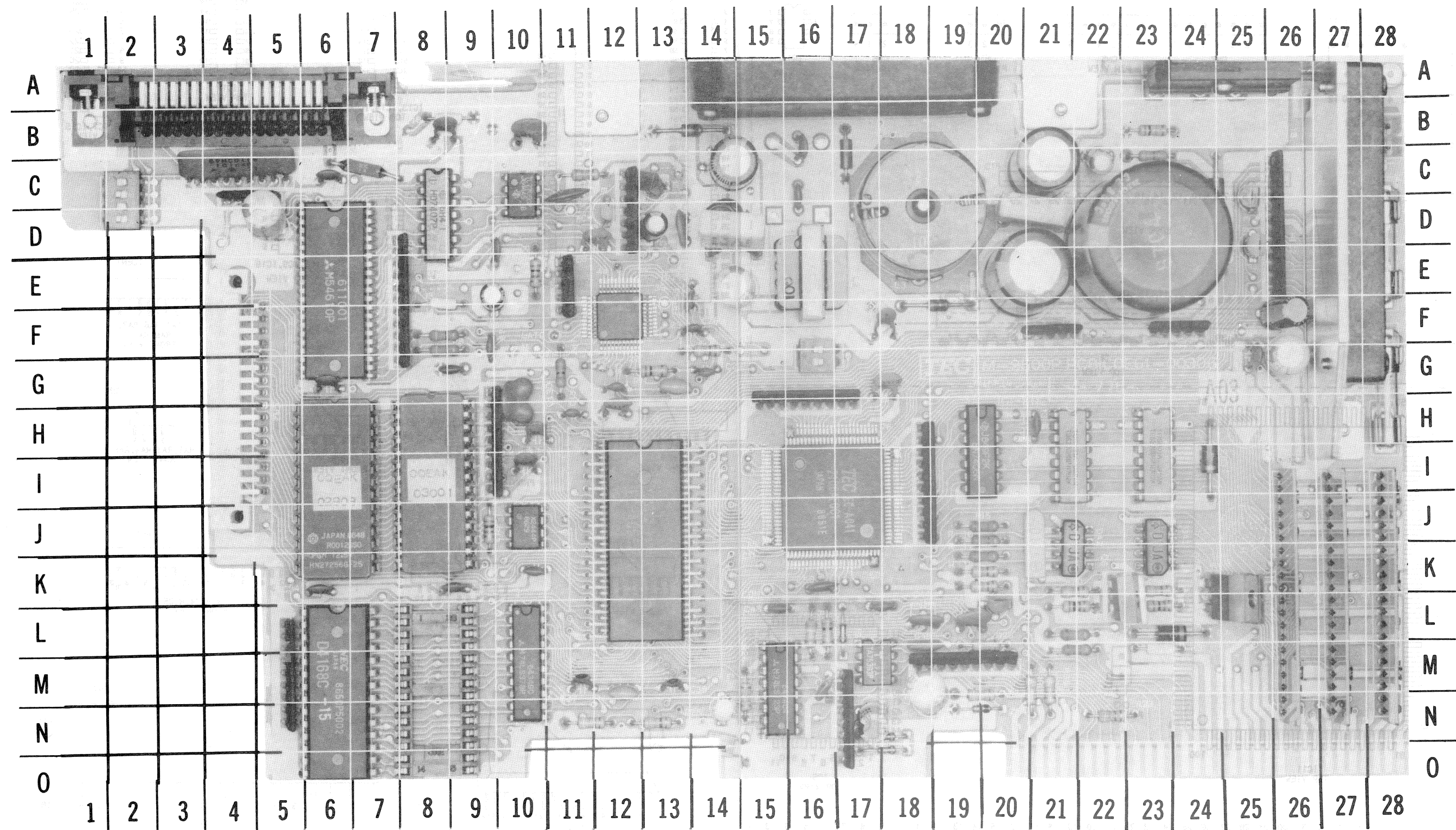
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BACKPLANE BOARD



IC PINOUTS & TERMINAL GUIDES



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LOGIC AND CONTROL BOARD GridTrace LOCATION GUIDE

C1	D-5	HR1	C-12	RA7	G-16
C2	C-6	HR2	D-26	RA8	I-18
C3	B-8	HR3	N-17	RA9	M-5
C4	B-10	IC1	E-6	RA10	M-19
C5	E-9	IC2	D-8	SW1	G-16
C6	D-10	IC3	C-10	SW2	C-2
C7	C-11	IC5	F-12	X1	G-13
C8	D-12	IC6	H-10	X2	M-12
C9	D-13	IC7	I-8	ZD1	B-14
C10	D-13	IC9	J-10	ZD2	F-19
C11	C-14	IC10	J-13	ZD3	I-24
C12	E-14	IC11	I-16	ZD4	N-20
C13	B-16	IC12	I-20		
C14	C-16	IC13	I-21		
C15	C-21	IC14	I-23		
C16	C-22	IC15	M-6		
C17	E-21	IC17	M-10		
C18	D-23	IC18	M-15		
C19	G-6	IC19	M-17		
C20	G-9	IR	A-25		
C22	I-10	J1	B-9		
C23	G-12	J2	C-13		
C24	H-11	J3	E-8		
C25	H-12	J4	E-8		
C26	F-14	L1	D-14		
C27	G-14	L2	E-16		
C28	F-18	L3	D-18		
C29	G-18	Q1	D-12		
C30	H-21	Q2	C-13		
C31	F-26	Q3	C-25		
C32	G-25	Q4	D-28		
C33	G-26	Q5	L-20		
C34	K-6	Q6	L-22		
C35	K-9	Q7	L-25		
C36	K-10	R2	C-11		
C37	M-11	R3	D-14		
C38	M-13	R4	D-21		
C39	N-14	R5	B-23		
C40	O-14	R6	C-23		
C41	M-16	R7	F-8		
C42	N-17	R8	F-8		
C43	L-17	R10	G-11		
C44	L-18	R11	G-13		
C45	L-18	R12	F-14		
C46	L-19	R13	J-9		
C47	M-18	R14	L-16		
C48	L-15	R15	J-20		
C49	F-9	R16	J-20		
C50	K-16	R17	K-20		
C51	E-14	R18	K-20		
C52	H-10	R19	K-20		
CA1	C-4	R20	K-22		
CE	O-24	R21	L-22		
CE1	G-10	R22	K-23		
CN1	A-4	R23	L-23		
CN2	G-4	R24	N-11		
CN3	B-28	R25	N-13		
D3	C-25	R26	M-15		
D4	N-18	R27	L-16		
D5	L-17	R28	M-20		
D6	O-18	R29	L-22		
D7	L-23	R30	M-22		
DA1	J-21	R31	M-23		
DA2	K-21	R32	M-20		
DA3	K-23	R33	N-22		
FB	C-17	R34	E-10		
FU1	D-28	R35	M-21		
FU2	G-28	R36	M-21		
FU3	C-7	RA1	C-4		
HIC1	A-17	RA2	E-8		
HIC2	D-28	RA3	E-11		
HIC3	K-26	RA4	F-21		
HIC4	K-27	RA5	F-24		
HIC5	K-28	RA6	H-10		

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DISASSEMBLY INSTRUCTIONS

NOTE: The various parts referred to in the Disassembly procedures can be located on Mechanical Photo.

CPU BOARD

Remove two screws holding back cover and remove cover. Disconnect Connector CN3 located on CPU Board. Pull CPU Board from Printer.

TOP COVER

Remove Carriage cover and paper covers from top cover. Remove two screws from rear of top cover. Release three tabs holding front of top cover to bottom cover. Disconnect Control Panel Connector and remove top cover.

PRINTER MECHANISM

Remove CPU Board. Remove top cover. Remove five screws holding Printer mechanism to bottom cover and remove Printer mechanism.

TRANSFORMER BLOCK

Remove Printer mechanism. Remove three screws holding Transformer block to bottom cover and remove Transformer block.

BOTTOM COVER

Remove Printer mechanism and Transformer block. Remove bottom shield plate. Remove bottom cover.

PRINT HEAD

Remove top covers. Position Carriage assembly so Print Head is accessible. Remove ribbon cartridge if installed. Release white plastic Print Head clamp and lift Print Head up.

PLATEN

Remove top cover and Print Head. Remove two screws holding card holder to Carriage assembly, and remove card holder. Remove platen knob and release lever from platen. Remove two screws from left and right platen plates.

Remove E-ring from tractor gear that meshes with platen gear and remove tractor gear. While holding ball roller shaft clear of platen, lift platen up and out of Printer.

PAPER FEED MOTOR

Remove Printer mechanism. Remove E-ring from auto load lever located above Paper Feed Motor and remove auto load assembly. Disconnect Connector CN7 from Backplane Board. Remove two screws holding paper feed motor from left platen frame and remove paper feed motor from Printer.

CARRIAGE MOTOR

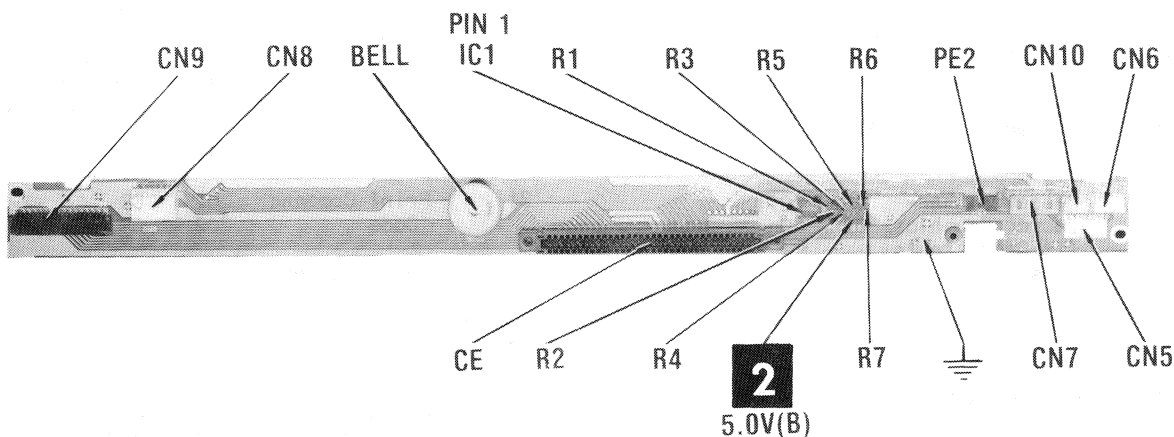
Remove Printer mechanism. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage pulley. Disconnect Connector CN5 from Backplane Board. Remove three screws holding Carriage Motor to Printer mechanism and remove Carriage Motor from Printer.

CARRIAGE ASSEMBLY

Remove Printer mechanism. Remove two E-rings from bail roller shaft and remove bail roller shaft from Printer. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage pulley. Release ribbon wire from spring on left platen frame and secure both ends of ribbon wire to Carriage assembly so it does not unwind from from ribbon pulley. Remove Carriage shaft bushings, located on each end of Carriage shaft, from slots in left and right platen frames. Disconnect Print Head cable from Connector on Print Head Board. Lift Carriage assembly up and out of Printer.

CARRIAGE BELT

Remove top cover. Remove Print Head. Remove screw holding Carriage belt clamp to Carriage assembly and remove Carriage belt clamp. Loosen screw on Carriage belt pulley arm. Push in on Carriage belt pulley arm and remove Carriage belt from Carriage belt pulley.



GENERAL OPERATING INSTRUCTIONS

SELF-TEST

Self-Test is initiated by pressing and holding LF (Line Feed) button or TOF (Top of Form) button while turning Printer On. Printer will continuously print until power from Printer is removed. Self-Test can be interrupted by pressing LF button and resumed by pressing On-Line button. When LF button is used to start Self-Test, Printer will print the Graphics Character Set. When TOF button is pressed, Printer will print the Standard Character Set.

SET-UP MODE

Set-Up Mode is used to select Printer's programmable functions. Functions will remain set until reprogrammed. Pressing and holding the LQ (Letter Quality) button while turning Printer On will activate Set-Up Mode and print out the first five functions, menu and status numbers. Pressing and holding On-Line and LQ button while turning Printer On will activate Set-Up Mode and print out all available functions, menu and status numbers. All indicators will be Off except the LQ lamp which will be blinking.

SET-UP MODE BUTTON FUNCTIONS

LQ Button: When pressed while On-Line lamp is blinking, turns Off On-Line lamp and LQ lamp begins blinking. Printer in Function Set-Up Mode. When pressed while LQ lamp is blinking, stores selected function settings into memory and exits Set-Up Mode.

On-Line Button: When pressed while LQ lamp is blinking turns Off LQ lamp and On-Line lamp begins blinking. Printer in Menu Set-Up Mode.

LF Button: When pressed while Printer in Function Set-Up Mode, increases function number. When pressed while Printer in Menu Set-Up Mode increases menu number.

TOF Button: When pressed while Printer in Function Set-Up Mode, decreases function number. When pressed while Printer in Menu Set-Up Mode, decreases menu number.

TABLE 1
FUNCTION SETTINGS

Function No.	Function	Menu No.	Status	Function No.	Function	Menu No.	Status
00	Reset Command	*01 02	ESCc1 ESCc	14	Print Direction	*01 02 03	Bidirectional Bidirectional Unidirectional
01	Form Length	01 02 03 04 05 06 07 08 *09 10 11 12	3 inches 3.5 inches 4 inches 5.5 inches 6 inches 7 inches 8 inches 8.5 inches 11 inches 12 inches 14 inches 15 inches	15	LF at Full Buffer	*01 02	On Off
02	Line Spacing	*01 02	1/2 inches 1/8 inches	16	Paper Empty Detection	*01 02	On Off
03	Character Pitch	*01 02 03 04	10 CPI 12 CPI 17 CPI Proportional	18	Type of Zero	*01 02	0 0
04	LQ Switch Function	*01 02	Select LQ Select NLQ	19	Character Set	01 02 *03 04 05 06 07 08 09 10 11 12 13 14 15 16	Japanese French American British German Swedish Italian Spanish Danish Norwegian Netherlandish African American French Canada French II British II
05	Buzzer	*01 02	On Off	21	Print Command Code	01 *02	CR CR,LF,VT,FF,US
06	Cassette Character Graphics (If Cassette is installed)	01 *02	Off On	22	Carriage Return	*01 02	CR CR+LF
11	One Line Buffer	01 *02	On Off	23	CAN Code	*01 02	On Off
12	Code Length	01 *02	7 bit 8 bit	24	Processing of DC1/CC3	*01 02	On Off
13	On-Line Selection at Power On	*01 02	On Off	25	Processing of S0/S1	*01 02	On Off

GENERAL OPERATING INSTRUCTIONS (Continued)

<u>Function No.</u>	<u>Function</u>	<u>Menu No.</u>	<u>Status</u>
26	Form Feed Code	*01 02 03	FF LF Off
27	VT Setting	*01 02	1 inch 1 line
61	Auto Sheet Feeder	01 *02	 ASF310

<u>Function No.</u>	<u>Function</u>	<u>Menu No.</u>	<u>Data Buffer</u>	<u>Characters/Down Load Buffer</u>
41	Expanded CG RAM		STD 8K	STD 8K RAM
		01	2K 10K	
		02	1K 2K	95 DP Mode 95 DP/LQ Mode
		03	1K 2K	95 DP Mode 190 DP Mode
		04	1K 1K	95 DP Mode 128 LQ Mode

Serial Printer Additional Functions

Function No.	Function	Menu No.	Status										
81	Data received after Printer DeSelected	*01 02	All Data Received for 350MS										
82	DSR	01 *02	On Off										
83	RTS	*01 02	High when in Select Mode Synchronized with DTR										
84	CD	01 *02	On Off										
85	CTS	01 *02	On Off										
86	Select SD or CER	*01 02	SD CER										
91	Over Run	*01 02 03 04	<table><tr><th>Busy</th><th>Ready</th></tr><tr><td>20 bytes</td><td>100 bytes</td></tr><tr><td>256 bytes</td><td>336 bytes</td></tr><tr><td>512 bytes</td><td>592 bytes</td></tr><tr><td>1024 bytes</td><td>1104 bytes</td></tr></table>	Busy	Ready	20 bytes	100 bytes	256 bytes	336 bytes	512 bytes	592 bytes	1024 bytes	1104 bytes
Busy	Ready												
20 bytes	100 bytes												
256 bytes	336 bytes												
512 bytes	592 bytes												
1024 bytes	1104 bytes												
92	Selection of 7 bit or 8 bit data	01 *02	7 bit 8 bit										
93	Protocol	*01 02 03	RDY/BSY (Low) RDY/BSY (High) Xon/Xoff										
94	Stop Bit	*01 02	1 bit 2 bit										
95	Parity Bit	01 02 *03 04	No parity Odd Even Ignore										
96	Baud Bate	01 02 03 *04 05 06 07 08	9600 BPS 4800 BPS 2400 BPS 1200 BPS 600 BPS 300 BPS 200 BPS 110 BPS										

* Default setting.

TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

TEST EQUIPMENT (COMPUTERFACTS)

Equipment	B & K Precision Equipment No.	Sencore Equipment No.	Notes
OSCILLOSCOPE	1570A,1590A,1596	SC61	
LOGIC PROBE	DP51,DP21		
LOGIC PULSER	DP101,DP31		
DIGITAL VOM	2830,2806	DVM37,DVM56,SC61	
ANALOG VOM	277,111,116		
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57	
FREQUENCY COUNTER	1803,1805	FC71,SC61	
COLOR BAR GENERATOR	1211A,1251,1260,1249	CG25,VA62	
RGB GENERATOR	1260,1249		
FUNCTION GENERATOR	3020,3011,3030		
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44 PR-28(HV)	HP200	
TEMPERATURE PROBE	TP-28,TP-30		
CRT ANALYZER	467,470	CR70	
DIGITAL IC TESTER	560,550,552		
CAPACITANCE ANALYZER		LC53,LC75,LC76 LC77	
INDUCTANCE ANALYZER		LC53,LC75,LC76 LC77	

TROUBLESHOOTING

POWER SUPPLY

Turn Printer On and check for 120V AC between pins 1 and 3 of Power Transformer (T1). If not correct, check AC Fuse (FU), Power Switch (SW1) and components on AC Filter Board. If 120V AC is present, check for 31.8V AC between AC inputs of Bridge Rectifier (IR1). If not correct, check Fuse FU1, Connector CN3 and Transformer T1. If 31.8V AC is present, check for 42.5V at pin 16 of Voltage Regulator IC (HIC1). If not correct, check Bridge Rectifier IR1, Electrolytic C18 and Diode D3. If 42.5V is present, check voltage associated with IC HIC1. If voltages are not correct, check IC HIC1 and associated components. If voltages associated with IC HIC1 are good, check for 24.5V at pin 1 of Carriage Motor Driver IC (HIC2). If not correct, check DC Fuse (FU2), Electrolytics C17, C31, Zener Diode ZD2, Coil L3 and Resistor R4. If 24.5V is present, check for 5.0V at pin 2 of Reset (IC3). If not correct, check Electrolytic C11, Zener Diode ZD1, Coils L1, L2 and Resistor R3.

LINE FEED MOTOR

Check gear assembly for smooth operation. Turn Printer On, Off-Line, and press the TOF button. Check waveforms on pins 1, 2, 3, 4 of CPU (IC10). If not correct, refer to "CPU Operation" section of this Troubleshooting guide. If waveforms are present at IC10,

check for a logic High on pin 4 of Clock/RAM Control (IC5). If not correct, check waveforms on pin 21 of IC5. If waveform is not correct, check Oscillator X1 and Capacitors C27 and C23. If waveform is correct on pin 21 of IC5, check IC5. If logic is correct on pin 4 of IC5, check for 23.3V on collector of Switch Transistor (Q6). If not correct, check Q6, IC12 and associated components. If voltage is correct on collector Q6, check waveforms on pins 2, 7, 10, 15 of Line Feed Motor Driver (IC13). If not correct, check IC13 and associated components. If waveforms are correct at IC13, check Backplane Board Connector CE, Connector CN7 and Line Feed Motor (M2).

CARRIAGE MOTOR

Check Carrier belt and ribbon wire. If ribbon wire and Carriage belt are good, install paper and initiate Printer Self-Test. Check waveform on pin 12 of Carriage Motor Current Limit (IC18). If not correct, check IC18 and associated components. If waveform on pin 12 of IC18 is correct, check waveforms on pins 5, 7, 14 and 16 of Carrier Motor Driver (HIC2). If not correct, check waveform on pin 7 of Clock/RAM Control (IC5). If not correct, check IC5 and associated components. If waveform on pin 7 of IC5 is correct, check Head and Controller (IC11) and associated components. If IC11 is good, refer to "CPU Operation" section of this Troubleshooting guide. If waveforms are correct on pins 5, 7, 14 and 16 of HIC2, check

TROUBLESHOOTING (Continued)

waveforms on pins 2, 4, 6, 13, 15 and 17 of HIC2. If not correct, check HIC2. If HIC2 is good, check Hybrid Resistor Array (HR2) and Speed Select Transistors (Q3 and Q4). If waveforms are correct on pins 2, 4, 6, 13, 15 and 17 of HIC2, check Connector CE, Connector CN5 and Carriage Motor (M1).

PRINT HEAD

Check Print Head and Print Head Cable. If Print Head and Print Head Cable are good, load paper in Printer and initiate Printer Self-Test. Check waveform on pin 1 of IC19. If not correct, check IC19 and associated components. If waveform on pin 1 of IC19 is correct, check for pulses on pins 55 thru 63 and pins 64 thru 72 of Controller IC11. If missing, check waveform on pin 7 of Clock/RAM Control (IC5). If waveform is not correct, check IC5 and associated components. If waveform on pin 7 of IC5 is correct, check IC11 and associated components. If IC11 is good, refer to "CPU Operation" section of this Troubleshooting guide. If pulses are present on IC11, check for approximately 20.0V on pins 2, 4, 9, 11, 16 and 18 of Print Head Drivers (HIC3, HIC4 and HIC5). If voltages are not correct, check HIC3, HIC4 and HIC5. If voltages are correct, check Print Head.

VERIFY SENSOR OPERATION

Home Position Sensor: Place Carriage at Home Position. Check for a logic Low on pin 41 of CPU (IC10). If not correct, check Connectors CE, CNH1 and Home Position Switch (SW4).

Color Ribbon Sensor (if equipped): Install a color ribbon cartridge and check for a logic Low on pin 96 of Controller (IC11). If not correct, check Connectors CE, CNH1, CNH3 and Color Ribbon Switch (SW5).

Paper Empty Detector (PE1): Turn Printer On without paper installed. Check for a logic Low on pin 39 of CPU (IC10). If not correct, check for 4.9V on pin 2 of IC1A. If voltage is not correct, check Paper Empty Detector

(PE1). If voltage is correct, check IC1A and associated components.

Paper Empty Detector (PE2): Turn Printer On without paper installed. Check for a logic Low on pin 40 of CPU (IC10). If not correct, check Connector CE and Paper Empty Detector (PE2).

Auto Sheet Feed Switch: Turn Printer On, depress Auto Sheet Feed Switch (SW3) and check for a logic Low on pin 95 of Controller (IC11). If not correct, check Connectors CE, CN6 and Auto Sheet Feeder Switch.

Cover Open Switch: Remove Printer cover, turn Printer On and check for a logic High on pin 38 of CPU (IC10). If not correct, check Connectors CE, CN8 and Cover Open Switch.

CPU OPERATION

Check Reset Circuit. Check for 5.0V on collector of Switch Transistor (Q2) and 4.8V on pin 5 of Reset (IC3). Turn Printer Off. Check logic on pin 5 of IC3, logic reading should change from High to Low and then Off. Turn Printer On, logic reading should change from Low to High. If any voltage or logic reading is not correct, check IC3, Switch Transistors (Q1 and Q2) and associated components. If Reset circuit is good, check waveforms on pins 30 and 31 of CPU (IC10). If not correct, check Oscillator X2 and Capacitors C37 and C38. If waveforms are correct, check IC10 and associated components.

PRINTER WILL NOT RECEIVE DATA

(SELF-TEST WORKS)

Check logic associated with Interface (IC1). If logic is not correct on pins 1, 33, 35, 37, 38 and 41, refer to "CPU Operation" section of this Troubleshooting guide. If any other logic reading is not correct, check IC1 and associated components. If IC1 is good, check for a logic High on pins 2 and 12 of IC2. If not correct, check IC2. If IC2 is good, check Connector CN1 and Interface Cable.

MISCELLANEOUS ADJUSTMENTS

CARD HOLDER ADJUSTMENT

Loosen two screws holding card holder to Carriage assembly. Reposition card holder so paper can travel smoothly between card holder and platen. Tighten screws.

PRINT POSITION ADJUSTMENT

Install paper in Printer. Run Printer in Self-Test mode. Turn Printer Off. Measure between the inside of left platen frame and left side of capitol H starting a new row. Distance should be $59.4 \pm 1\text{mm}$. If measurement is out of tolerance, adjust print position by bending home position detector tab, located on

Carriage Motor frame. Recheck adjustment by performing above procedure and readjust if necessary.

PRINT HEAD GAP ADJUSTMENT

Remove card holder. Set paper thickness lever to top setting. Measure for $0.375 \pm 0.025\text{mm}$ gap between Print Head and platen at left, center and right position. If any measurement is out of adjustment, loosen screw holding paper thickness lever to Carriage assembly shaft. Adjust gap on paper thickness lever and tighten screw. Check adjustment by performing above procedure and readjust if necessary.

CP46
MODEL C315P,R,XP
C/10h

LOGIC CHART

PIN NO.	IC 1	PIN NO.	IC 1	PIN NO.	IC 1	PIN NO.	IC 2	IC 5	PIN NO.	IC 5	PIN NO.	IC 5
1	H	21	L	41	L	1	H	H	21	P	41	P
2	H	22	P	42	H	2	H	H	22	H	42	H
3	H	23	P			3	*	H	23	P	43	H
4	L	24	P			4	*	L(1)	24	H	44	*
5	H	25	P			5	*	L(2)	25	P		
6	L	26	P			6	*	*	26	P		
7	L	27	P			7	L	P	27	P		
8	L	28	P			8	*	P	28	P		
9	H	29	P			9	*	P	29	P		
10	H	30	P			10	*	P	30	P		
11	H	31	P			11	*	P	31	P		
12	H	32	H			12	H	P	32	H		
13	H	33	H			13	H	P	33	H		
14	H	34	L			14	H	P	34	P		
15	H	35	L			15		P	35	P		
16	H	36	H			16		P	36	P		
17	H	37	H			17		L	37	P		
18	H	38	H			18		P	38	L		
19	H	39	L			19		P	39	H		
20	H	40	L			20		P	40	*		

PIN NO.	IC 6	PIN NO.	IC 6	PIN NO.	IC 7	PIN NO.	IC 7	PIN NO.	IC 9	IC 10	PIN NO.	IC 10	PIN NO.	IC 10
1	H	21	P	1	H	21	P	1	L	H(3)	21	H(19)	41	H(8)
2	P	22	P	2	P	22	P	2	L	H(3)	22	H	42	P
3	P	23	P	3	P	23	P	3	L	L(3)	23	*	43	P
4	P	24	P	4	P	24	P	4	L	L(3)	24	L	44	P
5	P	25	P	5	P	25	P	5	L	L(4)	25	H	45	P
6	P	26	P	6	P	26	L	6	H	H(4)	26	P	46	P
7	P	27	P	7	P	27	H	7	H	H(4)	27	P	47	P
8	P	28	H	8	P	28	H	8	H	L(4)	28	H	48	P
9	P			9	P			9		L	29	P	49	P
10	P			10	P			10		L	30	P	50	P
11	P			11	P			11		L	31	P	51	P
12	P			12	P			12		L	32	L	52	P
13	P			13	P			13		L	33	H	53	P
14	L			14	L			14		L(6)	34	H(12)	54	P
15	P			15	P			15		L(5)	35	H(13)	55	P
16	P			16	P			16		L(7)	36	H(14)	56	P
17	P			17	P			17		H	37	L(16)	57	P
18	P			18	P			18		H	38	H(15)	58	P
19	P			19	P			19		H	39	H(17)	59	P
20	P			20	H			20		H	40	H(18)	60	P
													61	P
													62	P
													63	H
													64	H

LOGIC CHART (Continued)

PIN NO.	IC 11	PIN NO.	IC 11	PIN NO.	IC 11	PIN NO.	IC 11	PIN NO.	IC 11	PIN NO.	IC 12	IC 15	PIN NO.	IC 15
1	*	21	P	41	L	61	P	81	L(22)	1	L(6)	P	21	P
2	*	22	P	42	P	62	P	82	L(22)	2	H(24)	P	22	P
3	H	23	H	43	P	63	L	83	L	3	L(5)	P	23	P
4	P	24	H	44	P	64	P	84	P	4	H(23)	P	24	P
5	P	25	H	45	P	65	P	85	P	5	L(7)	P	25	P
6	P	26	*	46	P	66	P	86	P	6	H(25)	P	26	H
7	P	27	*	47	P	67	P	87	P	7	L	P	27	P
8	L	28	P	48	H	68	P	88	L	8	H(20)	P	28	H
9	P	29	P	49	H	69	P	89	H	9	L(1)	P		
10	P	30	P	50	H	70	P	90	H	10	H(21)	P		
11	P	31	P	51	*	71	P	91	H	11	L(2)	P		
12	P	32	P	52	*	72	P	92	H	12	L	P		
13	L	33	H	53	L	73	H	93	H	13	*	P		
14	P	34	P	54	P	74	H	94	H	14	H	L		
15	P	35	P	55	P	75	H	95	H(11)	15		P		
16	P	36	P	56	P	76	*	96	H(10)	16		P		
17	P	37	P	57	P	77	*	97	H(9)	17		P		
18	H	38	L	58	P	78	L	98	H	18		P		
19	P	39	P	59	P	79	P	99	H	19		P		
20	P	40	H	60	P	80	P	100	H	20		P		

PIN NO.	IC 17	IC 18
1	L	P
2	P	H
3	P	H
4	P	L
5	P	P
6	P	L
7	P	P
8	P	L
9	P	P
10	L	H
11	P	H
12	P	P
13	P	H
14	P	L
15	P	P
16	P	H
17	P	
18	P	
19	P	
20	H	

CP46
C.Itoh
MODEL C315P,R,XP

SCHEMATIC NOTES

- ▽ Isolated ground.
- * Circuitry not used in some versions
- Circuitry used in some versions
- ◊ See parts list
- ≡ Ground

Voltages measured with digital meter.

Waveforms and voltages are taken from ground, unless noted otherwise.

All measurements taken with Printer in Self-Test mode.

Supply voltage maintained as shown at input.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% unless noted.

Electrolytic capacitors are 50 volts or less, 20% unless noted.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

Measurements taken with switching, as shown, unless noted.

Logic Probe Display

L=Low

H=High

P=Pulse

*=Open (No lights On)

- (1) Logic Probe indicates H during Line Feed.
- (2) Logic Probe indicates H when Color Ribbon Motor is On.
- (3) Logic Probe indicates P during Line Feed.
- (4) Logic Probe indicates P when Color Ribbon Motor is ON.
- (5) Logic Probe indicates H when Alarm LED is On.
- (6) Logic Probe indicates H when On-Line LED is On.
- (7) Logic Probe indicates H when L.Q. LED is On.
- (8) Logic Probe indicates L when Carriage Assembly is in Home Position.
- (9) Logic Probe indicates L when Auto Feed Switch is activated.
- (10) Logic Probe indicates L when Color Ribbon Switch is activated.
- (11) Logic Probe indicates L when Auto Sheet Feed Switch is activated.
- (12) Logic Probe indicates L when ON-Line Button is pressed.
- (13) Logic Probe indicates L when L.F. Button is pressed.
- (14) Logic Probe indicates L when T.O.F. Button is pressed.
- (15) Logic Probe indicates L when L.Q. Button is pressed.
- (16) Logic Probe indicates H when Printer Cover is open.
- (17) Logic Probe indicates L when Paper Empty Sensor PE1 is activated.
- (18) Logic Probe indicates L when Paper Empty Sensor PE2 is activated.
- (19) Logic Probe indicates L when Bell is activated.
- (20) Logic Probe indicates L during Line Feed.
- (21) Logic Probe indicates L when Color Ribbon Motor is On.
- (22) Logic Probe indicates H or L when Printer is in Letter Quality or Near Letter Quality Mode.
- (23) Logic Probe indicates L when Alarm LED is On.
- (24) Logic Probe indicates L when On-Line LED is On.
- (25) Logic Probe indicates L when L.Q. LED is On.

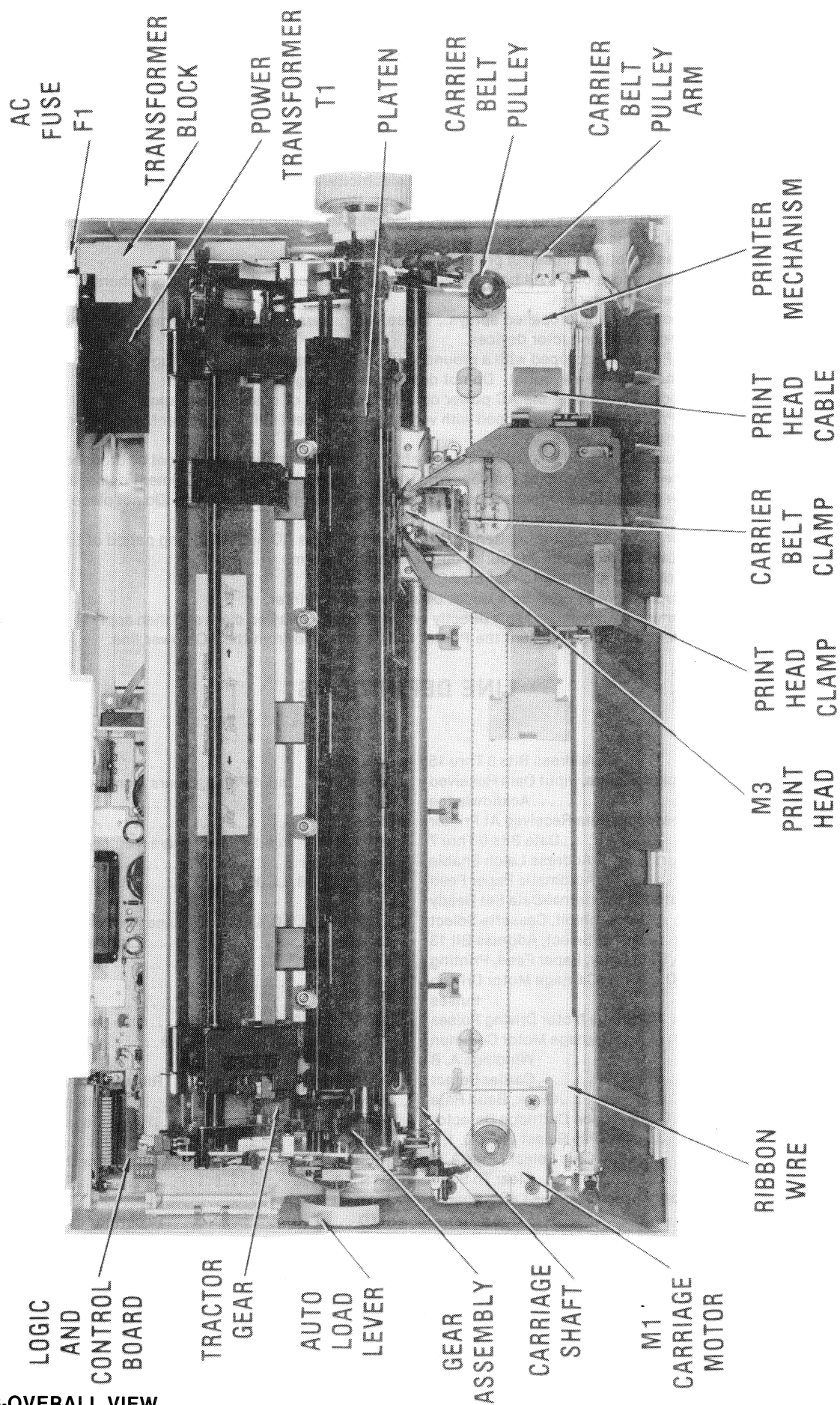
SAFETY PRECAUTIONS

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the Printer before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install board, mechanical or electrical parts, or other peripherals with Printer AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This Printer is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The Printer cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.
13. Never expose the Printer to water. If exposed to water turn the unit Off. Do not place the Printer near possible water sources.
14. Never leave the Printer unattended or plugged into the AC outlet for long period of time. Remove AC plug from AC outlet during lightning storms.
15. Do not allow anything to rest on AC power cord.
16. Unplug AC power cord from outlet before cleaning Printer.
17. Never use liquids or aerosols directly on the Printer. Spray on cloth and then apply to the Printer cabinet. Make sure the Printer is disconnected from the AC power line.

LINE DEFINITIONS

CP46
MODEL C315P,R,XP
C.Itoh

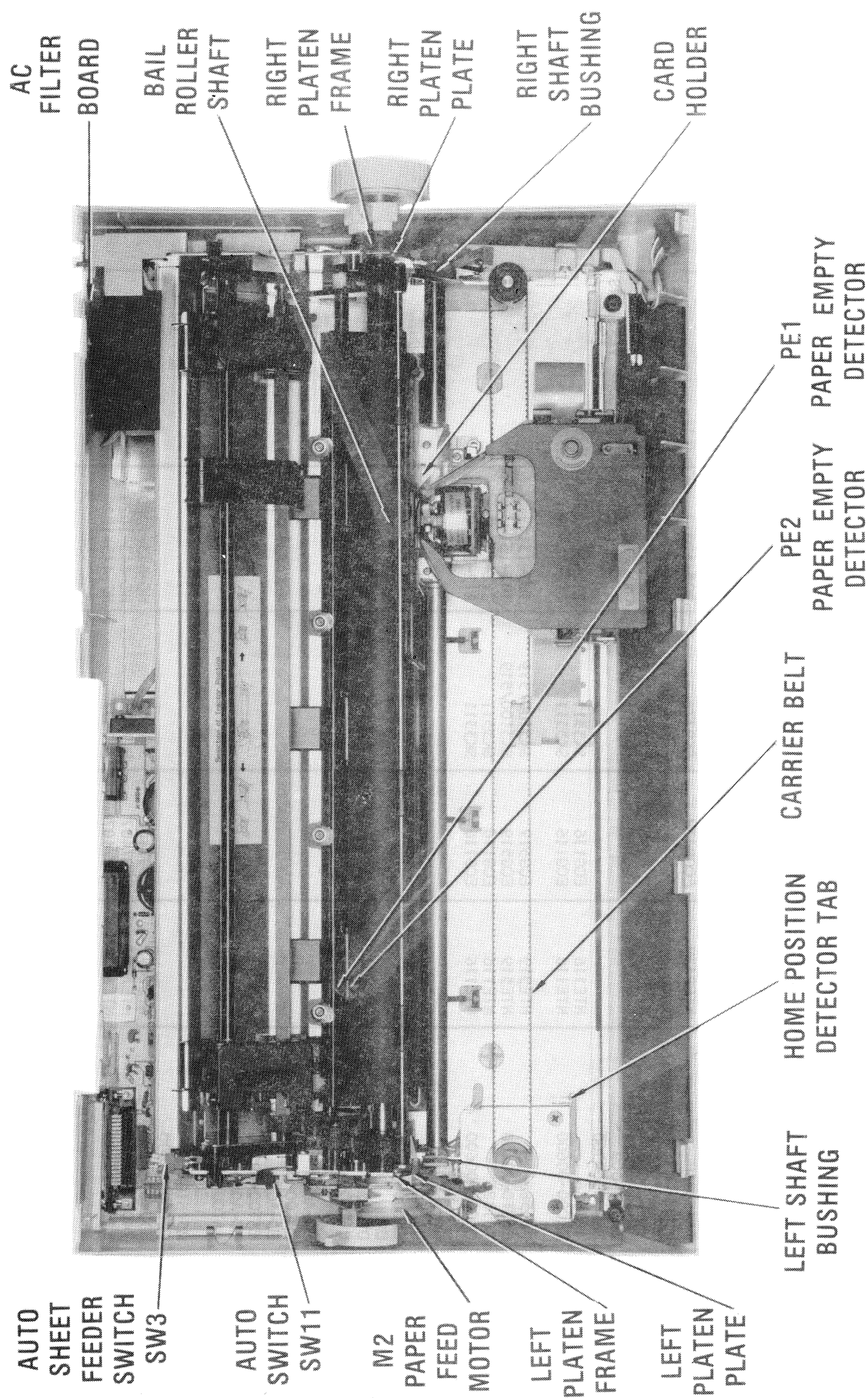
A0 THRU A15	Address Bits 0 Thru 15	HOLDA	Hold Acknowledge
ACK	Acknowledge, Input Data Received	IN PRIME ..	Input Prime, Clears Memory, Initializes System
ACK (TXD)	Acknowledge	INT1, INT2	Interrupts 1, 2
ACKNLG	Acknowledge, Data Received At Printer	IPT BSY	Input Busy
AD0 THRU AD7	Data Bits 0 Thru 7	IPT PRM ..	Input Prime, Clears Memory, Initializes System
ALE	Address Latch Enable	LATC	Latch Control
AUTO FEED	Automatic Paper Feed	LF 0A, LF 0B, LF 0C, LF 0D	Line Feed Motor Driving Pulses
AUTO XT(DSR)	Automatic External/Data Set Ready	LF A, LF B, LF C, LF D	Line Feed Motor Driving Pulses
BINH	Bank Inhibit, Cassette Select	LF COM	Line Feed Motor Common
BNKA13	Chip Select, Address Bit 13	LF ON	Line Feed Motor On
BUSY	Busy, Off Line, Data Entry, Paper Feed, Printing	MCON	Machine Control
CA 0A, CA 0B, CA 0C, CA 0D	Carriage Motor Driving Pulses	PE	Paper Empty Sensor
CA A, CA B, CA C, CA D	Carriage Motor Driving Pulses	RAM1, RAM2	Chip Selects, RAM1, RAM2
CA COMA, CA COMB	Carriage Motor Common Windings A, B	RBN 0A, RBN B, RBN C, RBN D	Ribbon Drive Motor Driving Pulses
CD	Carrier Detect	RBN COM	Ribbon Drive Motor Common
CK64	Clock, Baud Rate	RBN ON	Ribbon Drive Motor On
COLRIB	Color Ribbon Cartridge Detector	RD	Read, Memory or I/O Device
CS0, CS1, CS2	Chip Select Lines 0, 1, 2	RESET	Reset
CSA, CSB	Chip Select Lines A, B	RFSH	Refresh Address For Dynamic Memory
CTS	Clear To Send	RTS	Request To Send
DALE	Direct Memory Access Address Latch Enable	RWE	Write Enable
DATA 0 THRU DATA 7	Data Bits 0 Thru 7	RXD	Received Data, Acknowledge
DOT 1 THRU DOT 9	Print Head Driving Pulses	SCKN	Signal Clock
DSR	Data Set Ready	SEL	Select
DTR	Data Terminal Ready	SEL IN	Select Input
DUP 1 THRU DUP 9	Print Head Driving Pulses	SELECT	Select Line Indicates On Line Status
FAULT	Error State, Paper Empty, Cover Open	SPD 1, SPD 2, SPD 3	Printinting Speed Control, Carriage Motor
FLT (FAULT)	Fault, Error State	STROBE	Strobe Pulse For Read In Data
HMP SW	Home Position Switch	TXD	Transmitted Data
HOLD	Holds CPU While In Direct Memory Access Transfer		



CHASSIS-OVERALL VIEW

CP46

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MODEL C315P, R, XP



CHASSIS-OVERALL VIEW

PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.						NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.		
<u>BACKPLANE BOARD</u>							
IC1	TA75393P	NTE943M	ECG943M	SK9278	905-420	USED SOME VERSIONS	
<u>MAIN BOARD</u>							
D1,2	ERC84-009 EAC00-09500						
D3	1S1886 EAC00-00600	NTE116 NTE116	ECG116 ECG116	SK3311 SK3311	212-76-02 212-76-02		
D4,5,6	1S1588 EACT0-00400	NTE519	ECG519	SK3100/519	103-131		
D7	1S1886 EAC00-00600	NTE519 NTE116 NTE116	ECG519 ECG116 ECG116	SK3100/519 SK3311 SK3311	103-131 212-76-02 212-76-02		
DA1	D1CA D1CA20R EAC00-13100						
DA2,3	D1JA D1JA20 EAC00-13200						
HIC1	EC-A063 EAT00-09100						
HIC2	EC-A051 EAT00-09000						
HIC3,4,5	EC-A043 EAT00-08900						
IC1	M54610P EAS00-17800						
IC2	HD7407P 7407 EAQ00-15200	NTE7407 NTE7407 NTE7407	ECG7407 ECG7407 ECG7407	SK7407 SK7407 SK7407	HE-443-1020 HE-443-1020 HE-443-1020		

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
IC3	TL7705CP TL7705CP-B EAS00-12800					
IC5	EC-A104J EC-A104 EAY00-01300					
IC6	HN27256G-25 CQEK-03202					
IC7	D2764A-2 CQEK-03001					
IC9	X2444P X2444 EA001-23300					
IC10	EC-A056 EA006-64300					
IC11	EC-A041 EAY00-02600					
IC12	SN7406N 7406 EAQ00-07514	NTE7406 NTE7406 NTE7406	ECG7406 ECG7406 ECG7406	SK7406 SK7406 SK7406	HE-443-698 HE-443-698 HE-443-698	
IC13, 14	TD62308BP EAS00-16800					
IC15	D4168C-15 MN4364-15 EA001-21400					
IC16	MN4364-15 EA001-21400					
IC17	M74LS373P 74LS373 EAQ00-22614	NTE74LS373 NTE74LS373 NTE74LS373	ECG74LS373 ECG74LS373 ECG74LS373	SK74LS373 SK74LS373 SK74LS373	HE-443-867 HE-443-867 HE-443-867	USED SOME VERSIONS

2 PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	ZENITH PART No.	NOTES
IC18	M74LS123P 74LS123	NTE74LS123 NTE74LS123	ECG74LS123 ECG74LS123	SK74LS123 SK74LS123	HE-443-942 HE-443-942	
IC19	EAQ00-12914 TA75393P TA75393 EAS00-12900	NTE74LS123 NTE943M NTE943M NTE943M	ECG74LS123 ECG943M ECG943M ECG943M	SK74LS123 SK9278 SK9278 SK9278	HE-443-942 905-420 905-420 905-420	
IR	RBV-602 D5SB20					
Q1	EAE00-14700 2SC2458Y 2SC2458 EAA00-17500	NTE85 NTE85 NTE85	ECG85 ECG85 ECG85	SK3124A/289A SK3124A/289A SK3124A/289A	921-1114 921-1114 921-1114	
Q2	2SA1020Y 2SA1020 EAB00-09900	NTE25 NTE25 NTE25	ECG25 ECG25 ECG25	SK3841/294 SK3841/294 SK3841/294	121-Z9067 121-Z9067 121-Z9067	
Q3, 4, 5	2SA1015-0 2SA1015 EAB00-Q6600	NTE290A NTE290A NTE290A	ECG290A ECG290A ECG290A	SK9132 SK9132 SK9132	121-Z9003 121-Z9003 121-Z9003	*
Q6, 7	2SB601K 2SB601 EAB00-06500	NTE262 NTE262 NTE262	ECG262 ECG262 ECG262	SK3897/262 SK3897/262 SK3897/262	121-Z9059 121-Z9059 121-Z9059	
ZD1	RD6.2FB EAD00-16700	NTE137A NTE137A	ECG137A ECG137A	SK6V2/137A SK6V2/137A	103-Z9008 103-Z9008	
ZD2	RD27FB EAD00-25300	NTE146A NTE146A	ECG146A ECG146A	SK27V/146A SK27V/146A	103-Z9014 103-Z9014	
ZD3	RD027 EAD00-08700 RD27FB	NTE146A	ECG146A	SK27V/146A	103-Z9014	

* Lead configuration may vary from original.

WIRING DATA

Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor)
General-use Unshielded Hook-up Wire	8208 (Two-Conductor)
	8529 (Solid) Available in 13 Colors
	8522 (Stranded) Available in 13 Colors

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
	MAIN BOARD	
C37 (C52)	30 NPO 50V 5%	EBJT0-15600
C38 (C53)	30 NPO 50V 5%	EBJT0-15600
CA1	Capacitor Array	EBJ00-18500 (1)
	MAIN BOARD (ALTERNATE)	
CA1	Capacitor Array	EBJ00-18600 (2)

ITEM No.	RATING	MFGR. PART No.
	POWER SUPPLY	
C1	.22 250VAC	
C2	.22 250VAC	
C3	.0047 250V AC 20%	
C4	.0047 250V AC 20%	

Items Not Listed Are Normally Available At Local Distributors.

(1) 100pF 10% x 8

(2) .01 x 4

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
	MAIN BOARD			
HR1	Hybrid Resistor Array	ECQ00-01800		
HR2	Hybrid Resistor Array	ECQ00-02900		
HR3	Hybrid Resistor Array	ECQ00-02000		
RA1	Resistor Array	ECM00-00100 (1)		
RA2	Resistor Array	ECM00-08700 (2)		
RA3	Resistor Array	ECM00-00600 (3)		
RA4	Resistor Array	ECM00-00300 (4)		
RA5	Resistor Array	ECM00-00300 (4)		
RA6	Resistor Array	ECM00-08500 (5)		
RA7	Resistor Array	ECM00-00700 (6)		
RA8	Resistor Array	ECM00-23100 (7)		
RA9	Resistor Array	ECM00-08500 (5)		
RA10	Resistor Array	ECM00-05000 (8)		
	MAIN BOARD (ALTERNATE)			
R8	.22 5% 3W Metal Film	ECF00-15300		
RA2	Resistor Array	ECM00-00600 (1)		
RA3	Resistor Array	ECM00-08500 (2)		
RA4	Resistor Array	ECM00-00700 (3)		
RA5	Resistor Array	ECM00-00300 (4)		
RA6	Resistor Array	ECM00-00300 (4)		
RA7	Resistor Array	ECM00-05000 (5)		
RA8	Resistor Array	ECM00-08700 (6)		
RA9	Resistor Array	ECM00-23100 (7)		
RA10	Resistor Array	ECM00-08500 (2)		

- (1) 1000 5% x 4
 (2) 10K 5% x 10
 (3) 10K 5% x 4
 (4) 4700 5% x 4

- (5) 4700 5% x 8
 (6) 10K 5% x 8
 (7) 2200 5% x 9
 (8) 2200 5% x 8

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PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
L1	AC FILTER BOARD AC Line Filter POWER SUPPLY			
L1	RF Choke			
L2	RF Choke			
T1	Power Transformer			

FUSE DEVICES

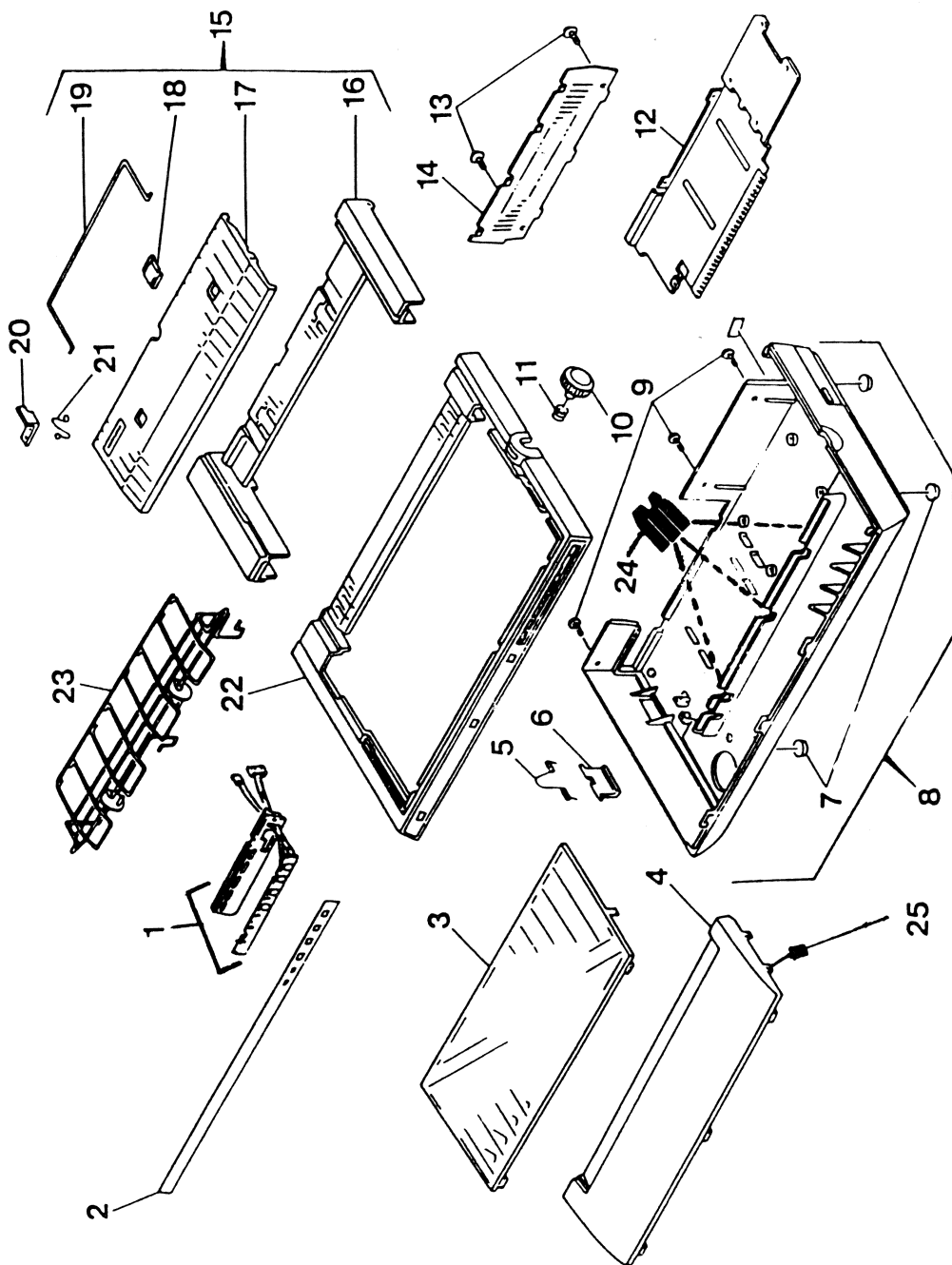
ITEM NO.	DESCRIPTION	MFGR. PART NO.		NOTES
		DEVICE	HOLDER	
FU1	MAIN BOARD 5A @ 125V AC Fast-Acting	EJG00-11100	EMB00-04100	(1) Two used for each fuse.
FU2	1A @ 125V DC Fast-Acting	EJG00-04300	EMB00-04100	
FU3	1A @ 125V DC Fast-Acting	EJG00-14200	EMB00-04100	
FU1	MAIN BOARD (ALTERNATE) 5A @ 125V AC Fast-Acting	EJG00-11100	EMB00-04100	
FU2	1A @ 125V DC Fast-Acting	EJG00-04300	EMB00-04100	
FU3	1A @ 125V DC Fast-Acting	EJG00-14200	EMB00-04100	
FU	POWER SUPPLY 2A @ 115V AC Slow-Blow 1A @ 240V AC Slow-Blow	EJG00-16000 EJG00-08500		

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
FB1	Ferrite Bead	EK100-04400	Power, Green
LED1	LED		Alarm, Red
LED2	LED		LQ (Letter Quality), Green
LED3	LED		On Line, Green
LED4	LED		Carriage
M1	Motor	CBABK-01802	Line Feed
M2	Motor	CQA45-50701	
M3	Print Head	CBABK-12902	
PE1	Sensor		Paper Empty
PE2	Sensor	EAF00-06700	Paper Empty
S1	Switch	EET00-18400	Power
SW1	Switch	EET00-18100	DIP
SW2	Switch	EET00-18200	DIP
SW3	Switch		Auto Sheet Feeder
SW4	Switch		Home Position Switch
SW5	Switch		Color Ribbon
SW6	Switch		LQ (Letter Quality)
SW7	Switch		On Line
SW8	Switch		LF (Line Feed)
SW9	Switch		TOF (Top of Form)
SW10	Switch		Cover
X1	Crystal	EKH00-07800	17.2MHz
X2	Crystal	EKH00-07900	12MHz

COVER BLOCK

1



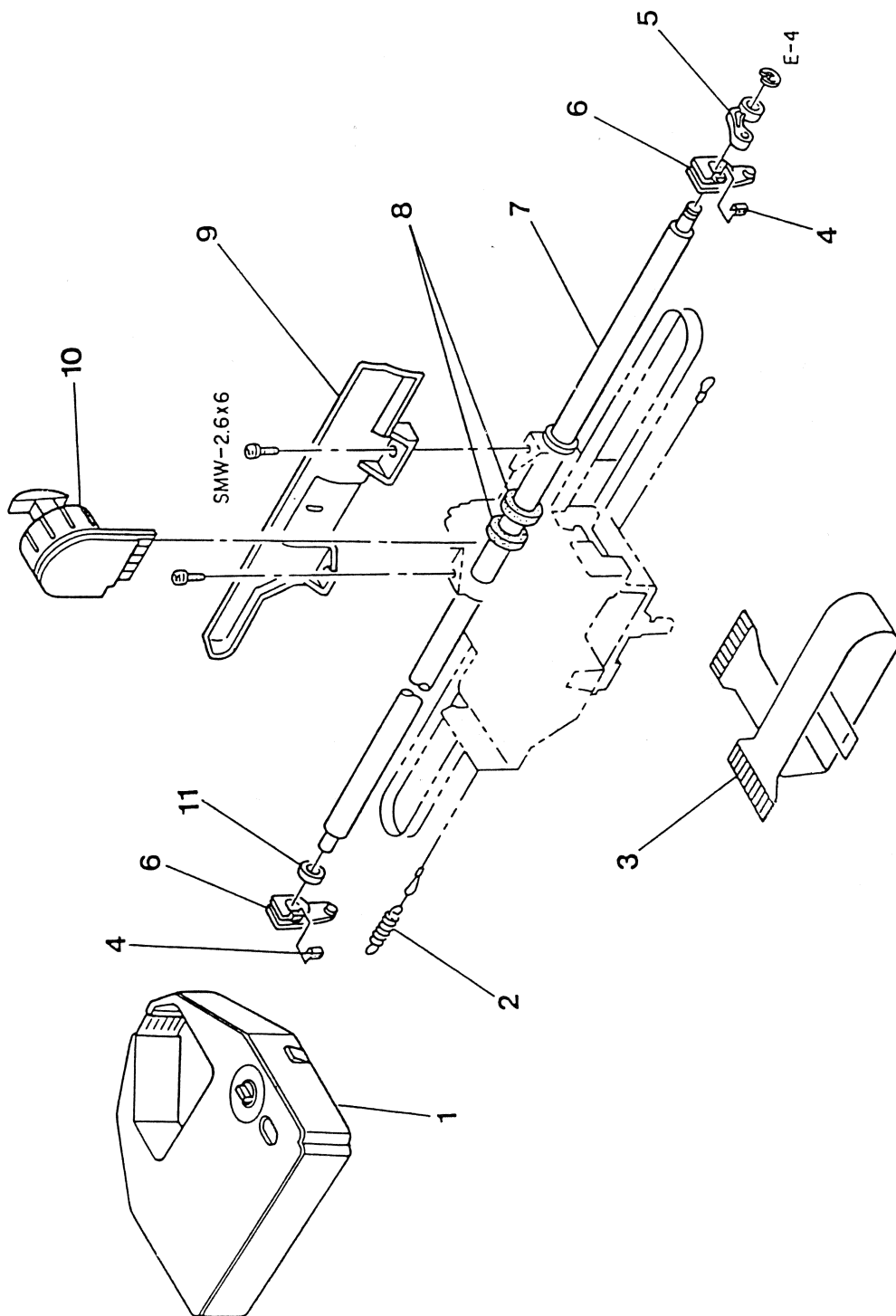
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1 COVER BLOCK

REF #	PART #	DESCRIPTION
1 - 1	CQABK-12301	OPERATION PANEL BK
1 - 2	CQA45-50502	SWITCH PLATE
1 - 3	CQA35-55501	PRINT COVER
1 - 4	CQAAK-51101	PRINT COVER AK2
1 - 5	CQA30-50701	CASSETTE SPRING
1 - 6	CQA35-15801	CASSETTE COVER
1 - 7	ZTB45-31801	FOOT RUBBER
1 - 8	CQAAK-51001	BOTTOM COVER AK2
1 - 9	SST240100A5	BACK COVER SCREW
1 - 10	CQA35-10702	PLATEN KNOB
1 - 11	CQA30-10402	PLATEN KNOB SPRING
1 - 12	CQAAK-51401	SHIELD PLATE AK
1 - 13	CQA10-11501	BACK COVER SCREW
1 - 14	CQA20-11702	BACK COVER
1 - 15	CQABK-50901	PAPER COVER BK
1 - 16	CQAAK-50601	PAPER COVER AK
1 - 17	CQAAK-50901	PAPER GUIDE COVER AK
1 - 18	CQA35-11001	PAPER GUIDE STAND
1 - 19	CQA45-50201	PAPER STAND
1 - 20	CQA35-11401	INDICATOR
1 - 21	CQA30-10101	INDICATOR SPRING
1 - 22	CQAAK-50701	TOP COVER BK
1 - 23	CQABK-51701	SEPARATOR BK
1 - 24	CQA45-53102	BOTTOM PASS MYLAR
1 - 25	CLA45-72801	REED SWITCH MAGNET

CARRIER BLOCK 1

5



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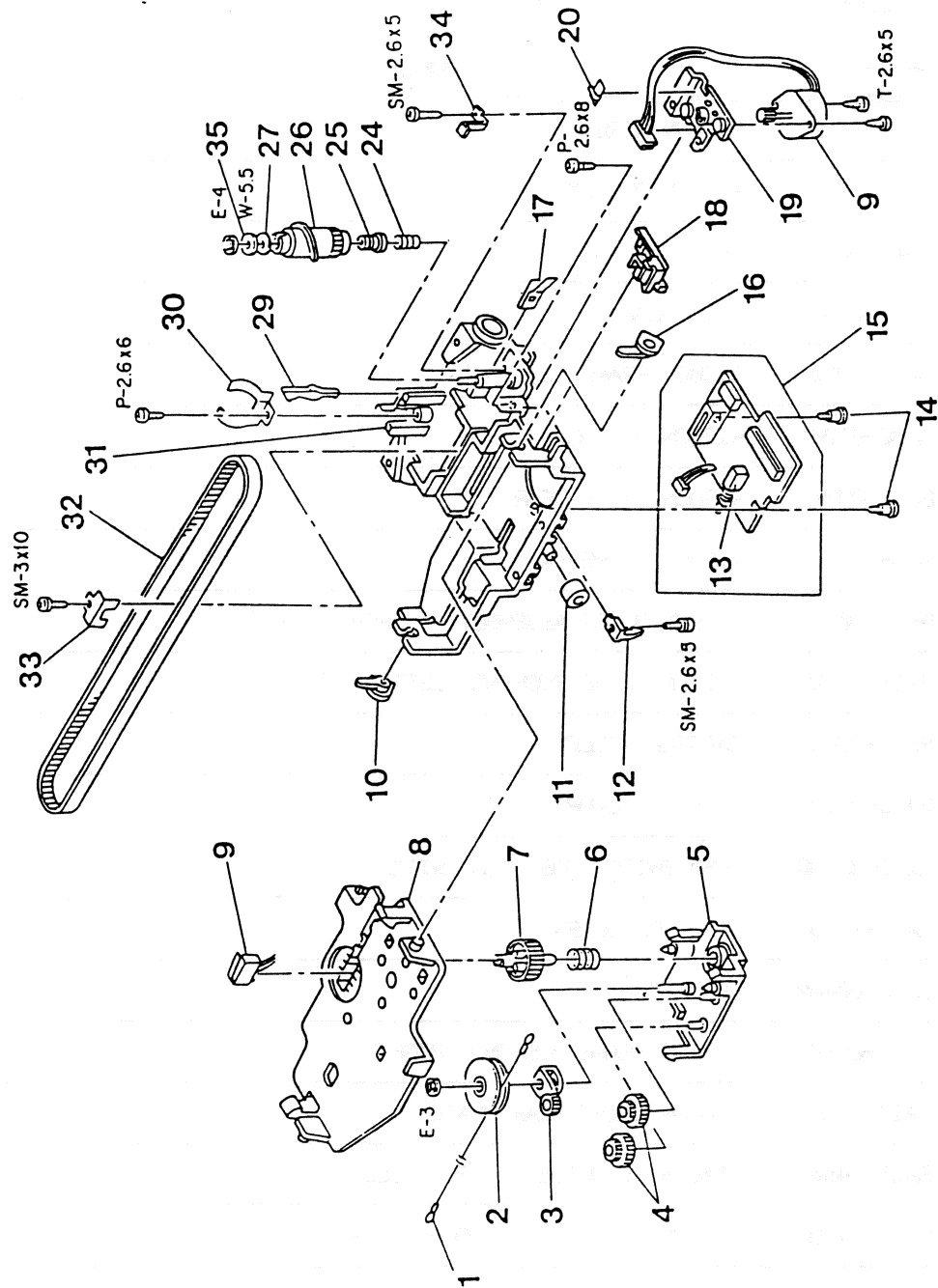
5 CARRIER BLOCK 1

REF #	PART #	DESCRIPTION
5 - 1	CQABK-12903	RIBBON CASSETTE (COLOR)
	CLABK-12802	RIBBON CASSETTE (BLACK)
5 - 2	CBA30-01301	RIBBON WIRE SPRING
5 - 3	CQE61-03501	FLEXIBLE CABLE
5 - 4	CBA20-02903	ADJUST PLATE (C) Ø.2mm
	CBA20-02902	ADJUST PLATE (B) Ø.1mm
	CBA20-02901	ADJUST PLATE (A) Ø.05mm
5 - 5	CBA35-01301	IMPRESSION CONTROL LEVER
5 - 6	CBA35-00701	CARRIER SHAFT BUSHING
5 - 7	CBA10-00301	CARRIER SHAFT
5 - 8	CBA45-02401	OIL LINK
5 - 9	CQAAK-10501	CARD HOLDER
5 - 10	CBABK-12902	PRINT HEAD (PACK)
5 - 11	CBA45-03201	CARRIER CAM

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CARRIER BLOCK 2

6



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6 CARRIER BLOCK 2

REF #	PART #	DESCRIPTION
6 - 1	CQA45-50101	RIBBON WIRE
6 - 2	CBA35-04701	RIBBON PULLEY
6 - 3	CZAAK-00401	SELECT PLATE
6 - 4	CZA35-00301	TWIN GEAR
6 - 5	CBA35-00601	RIBBON FRAME (B)
6 - 6	CBA30-01201	RIBBON SPRING
6 - 7	GBA35-00301	RIBBON DRIVE GEAR
6 - 8	CBA35-00501	RIBBON FRAME (A)
6 - 9	CBEAK-00301	RIBBON MOTOR ASSEMBLY FOR COLOR
6 - 10	CBA35-03701	RIBBON FRAME BUSHING (LEFT)
6 - 11	CBA35-00401	CARRIER ROLLER
6 - 12	CBA35-04001	CARRIER CLAMP
6 - 13	EEQ00-08600	HOME SWITCH POSITION SWITCH
6 - 14	CBA10-02101	HEAD PCB SCREW
6 - 15	CBEAK-00402	HEAD PCB
6 - 16	CBA35-03801	RIBBON FRAME BUSHING (RIGHT)
6 - 17	CBA20-02301	RIBBON SHIFT GEAR PLATE
6 - 18	CBA35-04501	LEAD WIRE GUIDE FOR COLOR
6 - 19	CBA8K-01301	RIBBON KIT FOR COLOR
6 - 20	CBA45-03301	WIRE CLAMP FOR COLOR

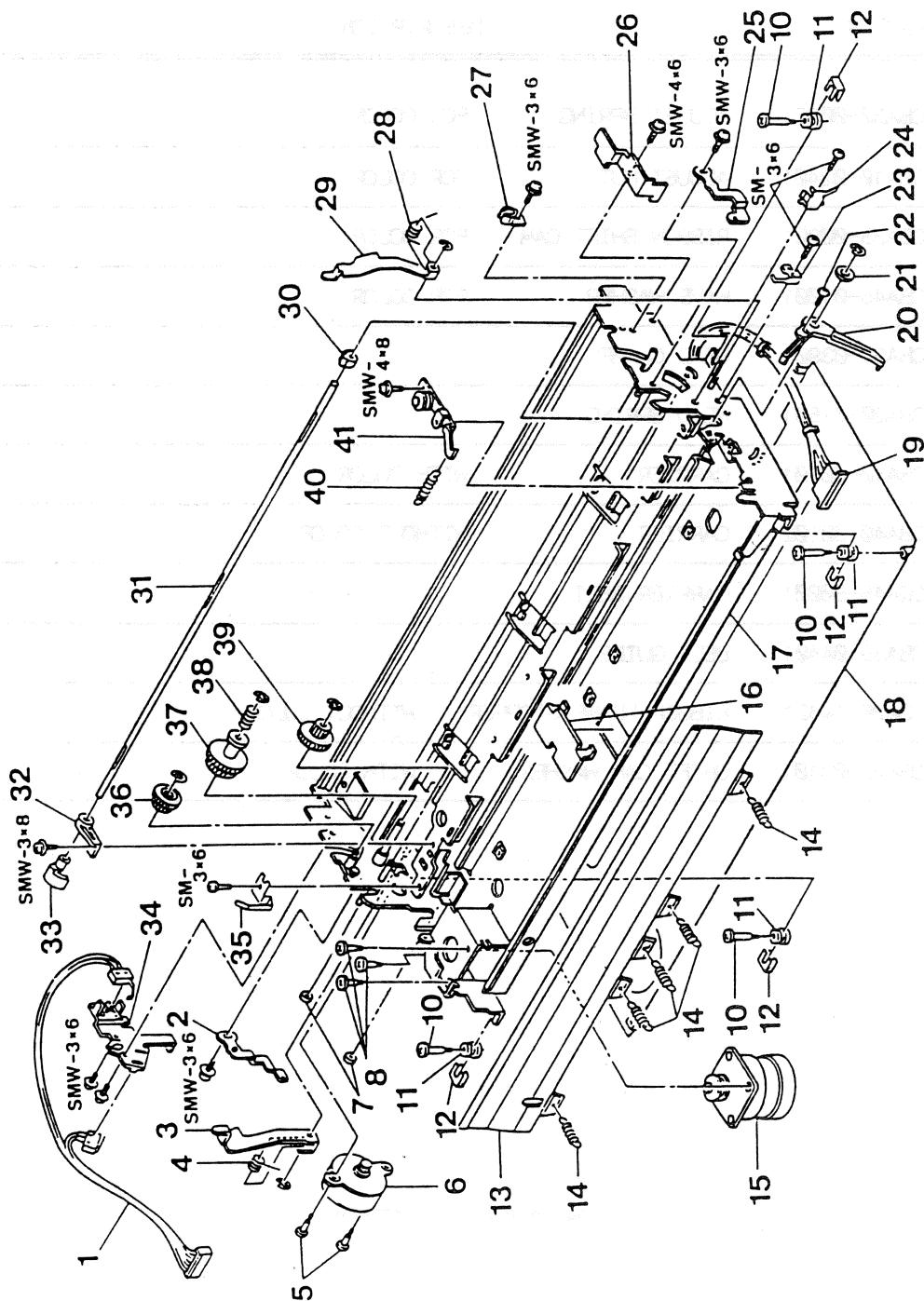
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6 CARRIER BLOCK 2 CONTINUED

REF #	PART #	DESCRIPTION	
6 - 24	CBA30-00801	ADJUST SPRING	FOR COLOR
6 - 25	CBA10-02401	ADJUST NUT	FOR COLOR
6 - 26	CBA35-00801	RIBBON SHIFT CAM	FOR COLOR
6 - 27	CBA45-04001	WAVE WASHER	FOR COLOR
6 - 29	CBA35-03901	HEAD CLAMP	
6 - 30	CBA20-01501	HEAD SPRING	
6 - 31	CBA40-00101	CARRIER	WITH COLOR
	CBA40-00102	CARRIER	WITHOUT COLOR
6 - 32	CQA45-50001	CARRIER BELT	
6 - 33	CBA35-04401	BELT GUIDE	
6 - 34	CQA20-14401	RIBBON FRAME STOPPER	WITHOUT COLOR
6 - 35	CBA20-03101	SHIFT CAM WASHER	WITH COLOR

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7 FRAME BLOCK

REF #	PART #	DESCRIPTION
7 - 1	QCEBK-01101	SENSOR 2 BK
7 - 2	QQA20-52201	PLATEN BUSHING PLATE (LEFT)
7 - 3	QQA20-51401	TRACTOR LOCK LEVER (LEFT)
7 - 4	QQA30-50501	TRACTOR LOCK SPRING (LEFT)
7 - 5	CBA10-01601	PAPER FEED MOTOR SET SCREW
7 - 6	QQA45-50701	PAPER FEED MOTOR
7 - 7	CBA45-01301	PAPER FEED MOTOR STOPPER
7 - 8	QQA10-11071	CARRIER MOTOR SCREW
7 - 10	QQA10-11301	FRAME SET SCREW
7 - 11	CLA45-50901	PRINTER CUSHION RUBBER
7 - 12	QQA20-12001	EARTH PLATE A
7 - 13	QQA20-52901	DEFLECTOR
7 - 14	QQA30-50302	DEFLECTOR SPRING
7 - 15	CBABK-01802	CARRIER MOTOR BK
7 - 16	QQA35-50701	FLEXIBLE CABLE HOLDER
7 - 17	QQA4K-51501	FRAME AK (2)
7 - 18	QQA45-53001	SHIELD BASE
7 - 19	QCE61-01601	12 PIN CABLE 1
7 - 20	QQA35-32002	IMPRESSION CONTROL LEVER (A)
7 - 21	CBA45-00501	IMPRESSION CONTROL LEVER WASHER
7 - 22	CBA45-00401	IMPRESSION CONTROL SCREW

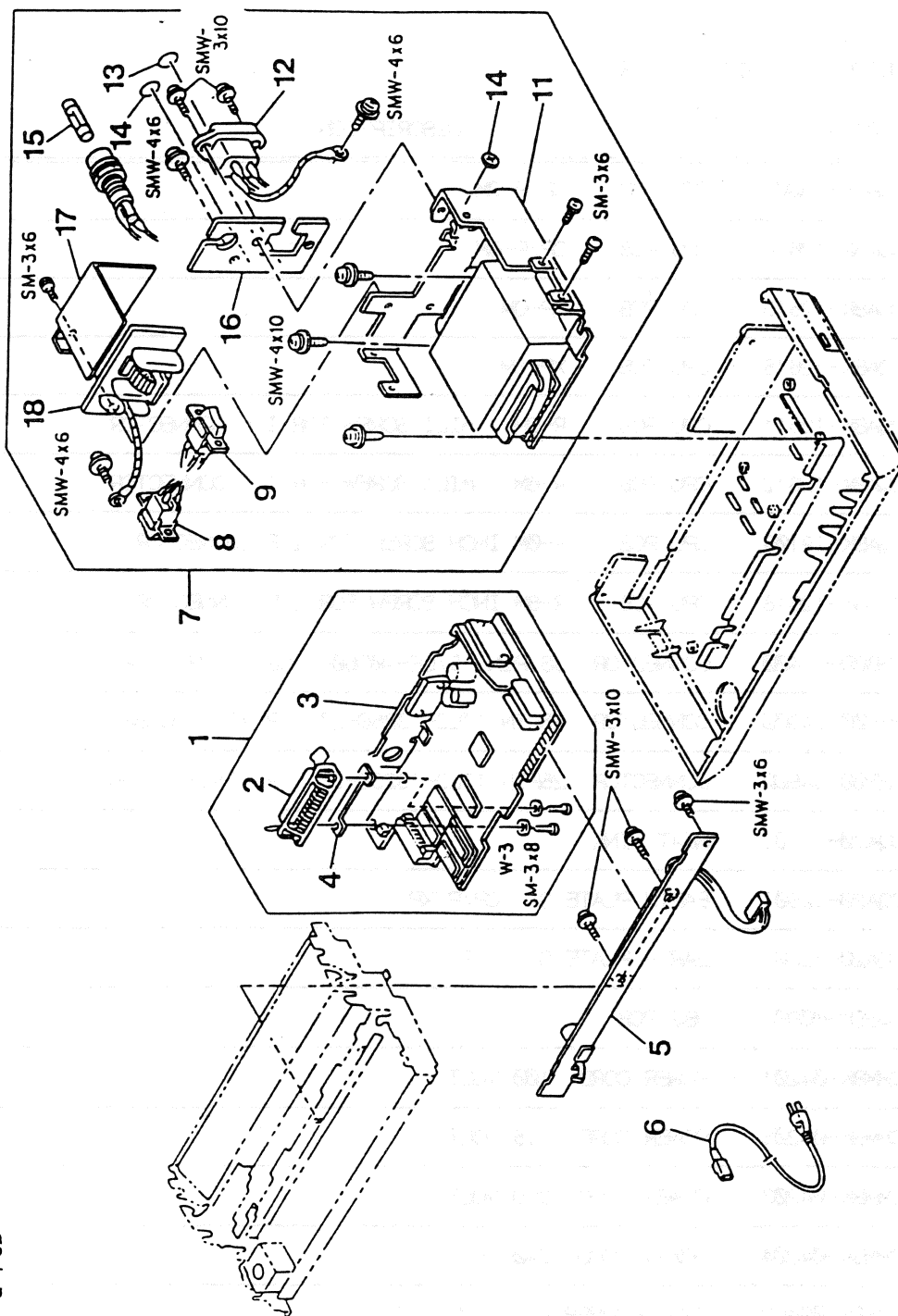
MODEL C315P,R,XP
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7 FRAME BLOCK CONTINUED

REF #	PART #	DESCRIPTION
7 - 23	CBA20-00101	CARRIER SHAFT SPRING PLATE (R)
7 - 24	CBA20-01401	FREE LEVER SPRING PLATE
7 - 25	CQA20-52101	PLATEN BUSHING PLATE (RIGHT)
7 - 26	CQABK-51401	PROTECTOR BK
7 - 27	CQA35-23001	TRACTOR HOLDER (RIGHT)
7 - 28	CQA30-50501	TRACTOR LOCK SPRING (RIGHT)
7 - 29	CQA20-51801	TRACTOR LOCK LEVER (RIGHT)
7 - 30	CBA35-02801	PINCH ROLLER GEAR
7 - 31	CQA10-50601	PINCH ROLLER SHAFT
7 - 32	CBA35-03001	SHIFT GEAR CAM SUPPORTER
7 - 33	CBA35-20101	SHIFT GEAR CAM
7 - 34	CQA35-51801	TRACTOR CATCH (LEFT)
7 - 35	CQA20-10901	CARRIER SHAFT SPRING PLATE (L)
7 - 36	CQA35-51601	TRACTOR IDLER GEAR
7 - 37	CQA35-51401	SHIFT GEAR
7 - 38	CBA30-01101	SHIFT GEAR SPRING
7 - 39	CQA35-20901	REDUCTION GEAR
7 - 40	CBA30-00301	CARRIER PULLEY ARM SPRING
7 - 41	CBAAK-00701	CARRIER PULLEY ARM

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8 POWER SUPPLY AND PCB (P / R)

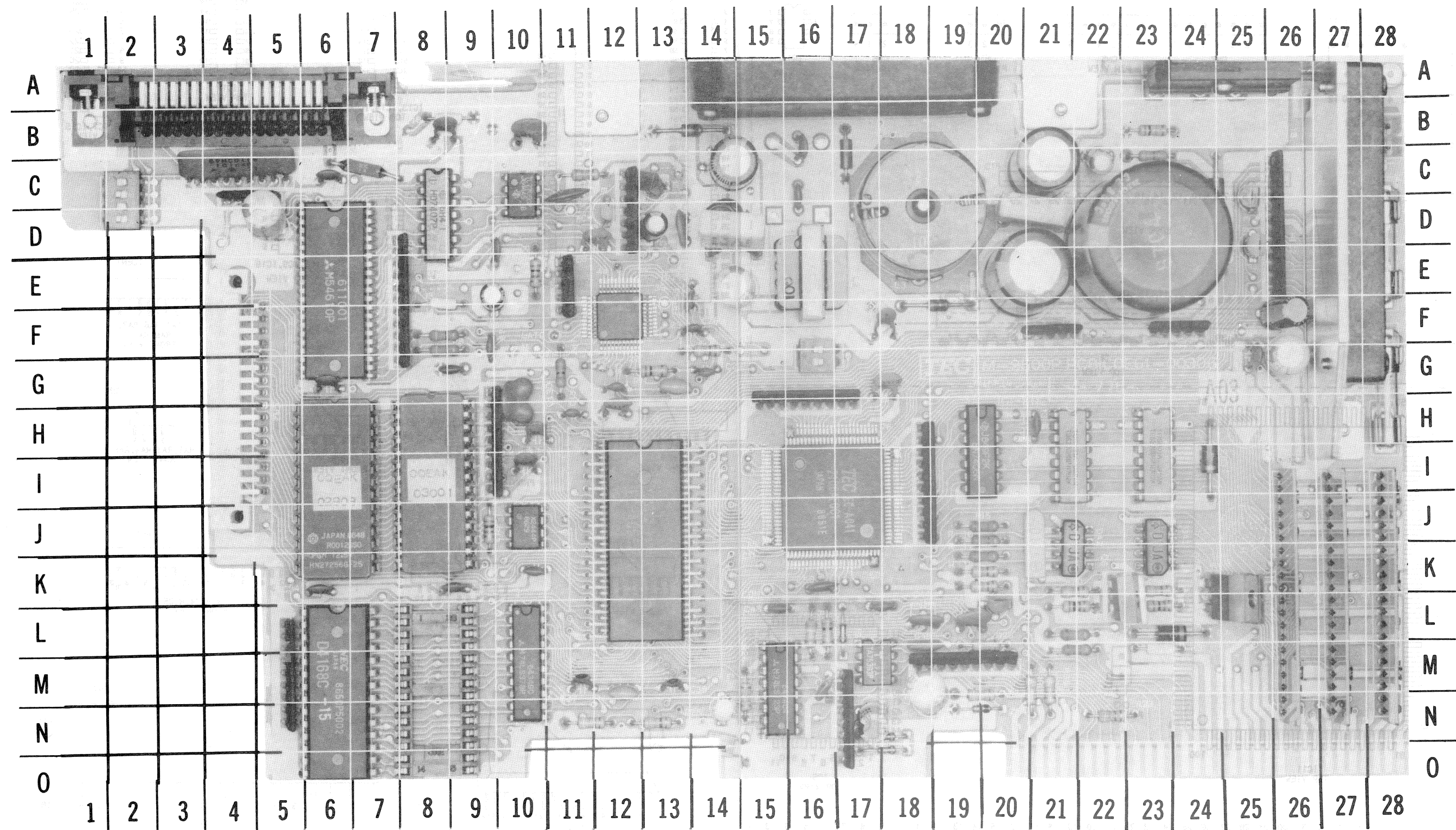
REF #	PART #	DESCRIPTION			
8 - 1	CQABK-19001	CPU PCB	CP/P-OM		
	CQABK-12610	CPU PCB	CP/P-8M		
	CQABK-12615	CPU PCB	XP-OM		
	CQABK-12616	CPU PCB	XP-8M		
	CQABK-12611	CPU PCB	R-OM	MILI SCREW FOR I/F CONNECTOR	
	CQABK-12612	CPU PCB	R-8M	MILI SCREW FOR I/F CONNECTOR	
	CQABK-19109	CPU PCB	R-OM	INCH SCREW FOR I/F CONNECTOR	
	CQABK-12618	CPU PCB	R-8M	INCH SCREW FOR I/F CONNECTOR	
8 - 2	EEB00-63400	CONNECTOR	36 PIN	57LE-40360-770B CP/P/XP	
	EEF00-34300	CONNECTOR	25PIN	17L3-13250-27 R MILI SCREW	
	EEF00-34500	CONNECTOR	25PIN	17L3-13250-27 R INCH SCREW	
8 - 3	CQA20-11101	HEAT SINK			
8 - 4	CQA20-12501	EARTH PLATE C	CP/P/XP		
	CQA20-12801	EARTH PLATE D	R		
8 - 5	CQEBK-00901	MB2 PCB			
8 - 6	CMMBK-04201	POWER CORD	100 VOLT		
	CMMBK-04205	POWER CORD	115 VOLT		
	CMMBK-04203	POWER CORD	220 VOLT		
	CMMBK-04204	POWER CORD	240 VOLT		
8 - 7	CQEBK-00403	TRANSFORMER BK	100 VOLT		
	CQEBK-00404	TRANSFORMER BK	115 VOLT		
	CQEBK-00603	TRANSFORMER BK	220 VOLT		
	CQEBK-00604	TRANSFORMER BK	240 VOLT		
8 - 8	EET00-18400	VOLTAGE CONTROL SWITCH ZLD01-10 220V/240V			

Courtesy of Manufacturer

8 POWER SUPPLY AND PCB (P / R) CONTINUED

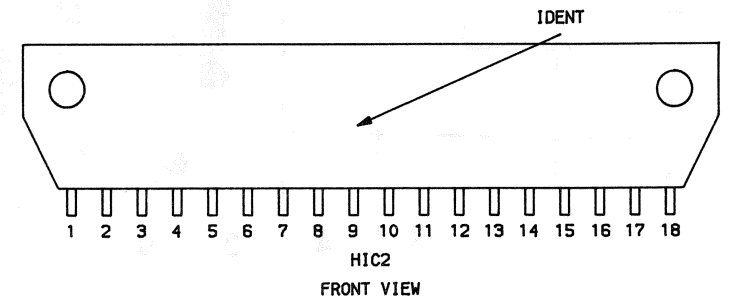
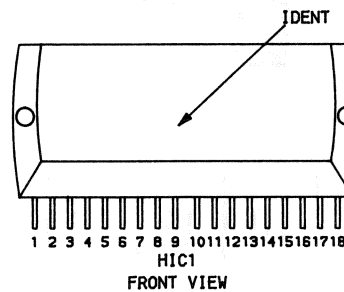
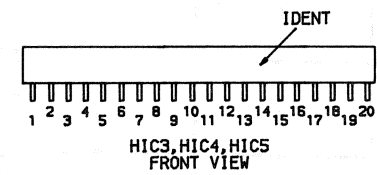
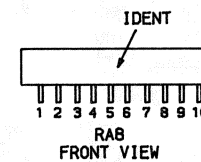
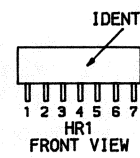
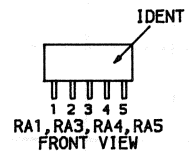
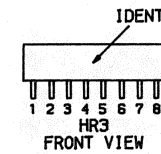
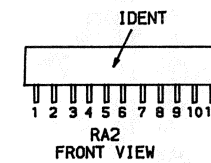
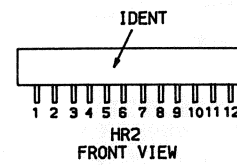
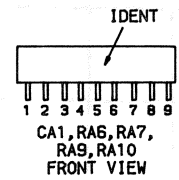
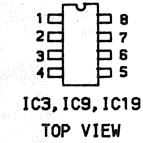
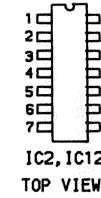
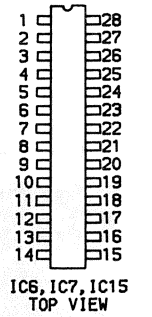
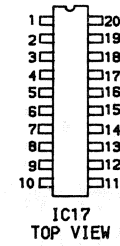
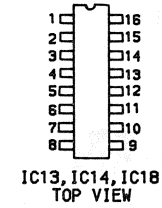
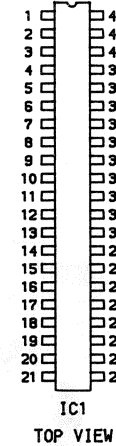
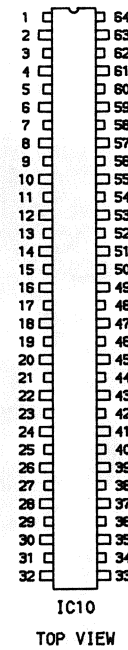
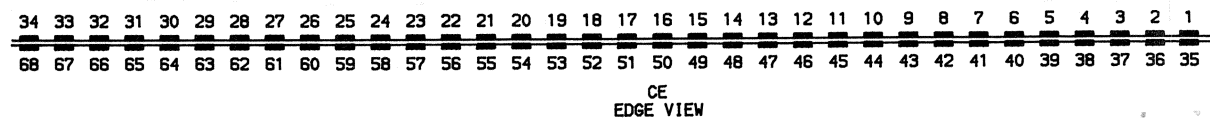
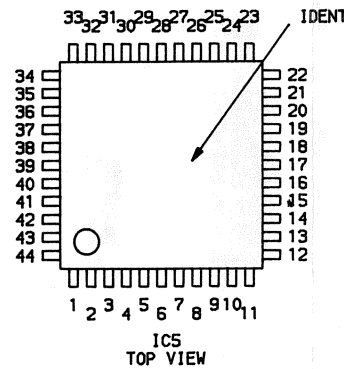
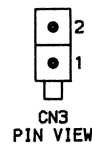
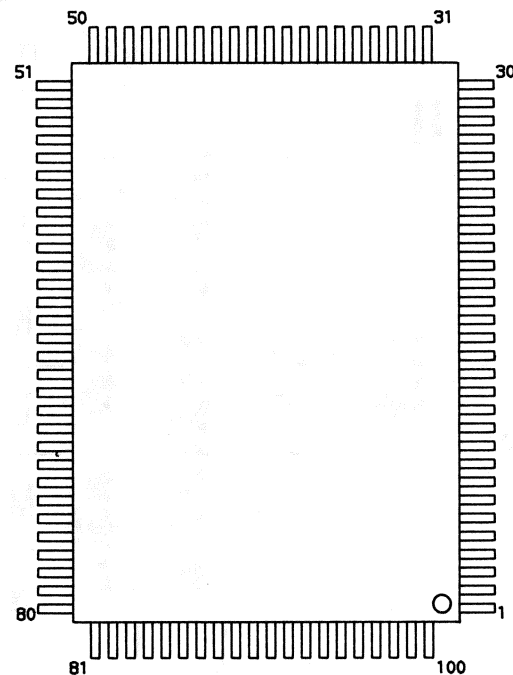
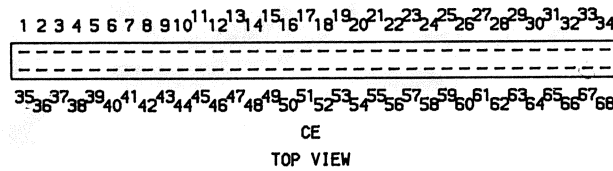
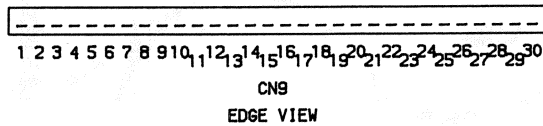
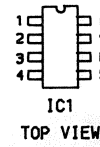
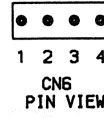
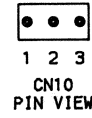
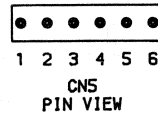
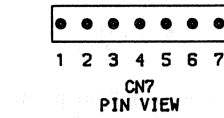
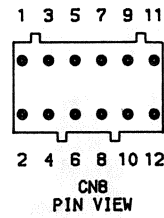
REF #	PART #	DESCRIPTION
8 - 9	EET 00 -195 00	POWER SWITCH ZLK 01 -67
8 - 10	CQA45-114 01	VOLTAGE SELECTION LABEL 22 0 V/24 0 V
8 - 11	CQE61- 00802	95-PTF-1 10 0 V/115V
	CQE61- 01002	95-PTF-2 22 0 V/24 0 V
8 - 12	CKE61- 05801	POWER INLET
8 - 13	CQA45-12 001	VOLTAGE LABEL 22 0 V
	CQA45-12 002	VOLTAGE LABEL 24 0 V
8 - 14	CLA45-729 01	NAME PLATE (EARTH)
8 - 15	EJG 00 -16 000	MINI FUSE MT4-2A 10 0 V/115V
	EJG 00 - 08500	MINI FUSE EAK-1.0A 22 0 V/24 0 V
8 - 16	CQA 20 -116 01	CORD SUPPORTER
8 - 17	CQA45-145 01	TRANS BARRIER
8 - 18	CQEBK- 00301	NOISE FILTER PCB 10 0 V/115V
	CQEBK- 00302	NOISE FILTER PCB 22 0 V/24 0 V

Courtesy of Manufacturer

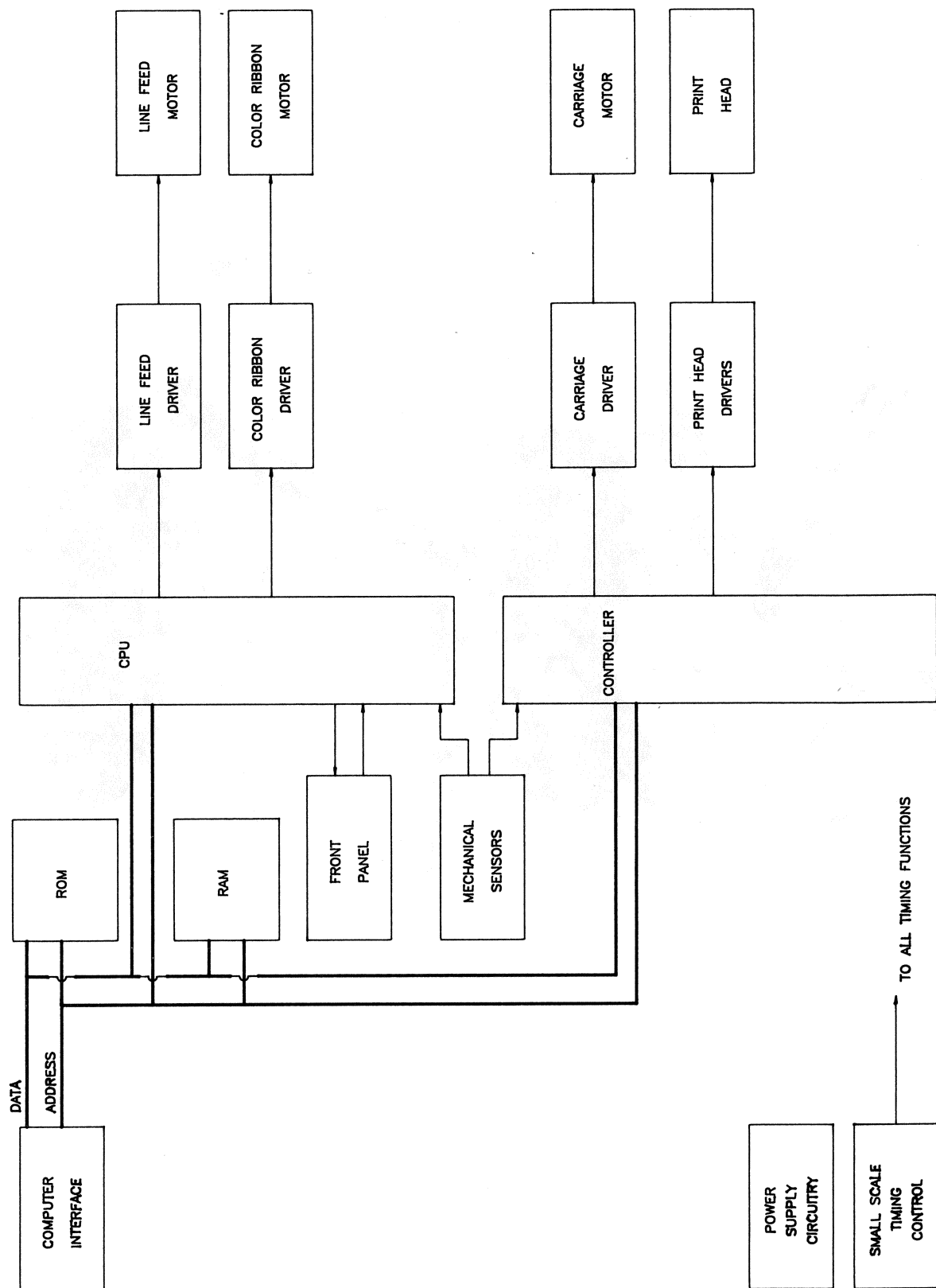


C.Itoh
MODEL C315P, R, XP

BACKPLANE BOARD

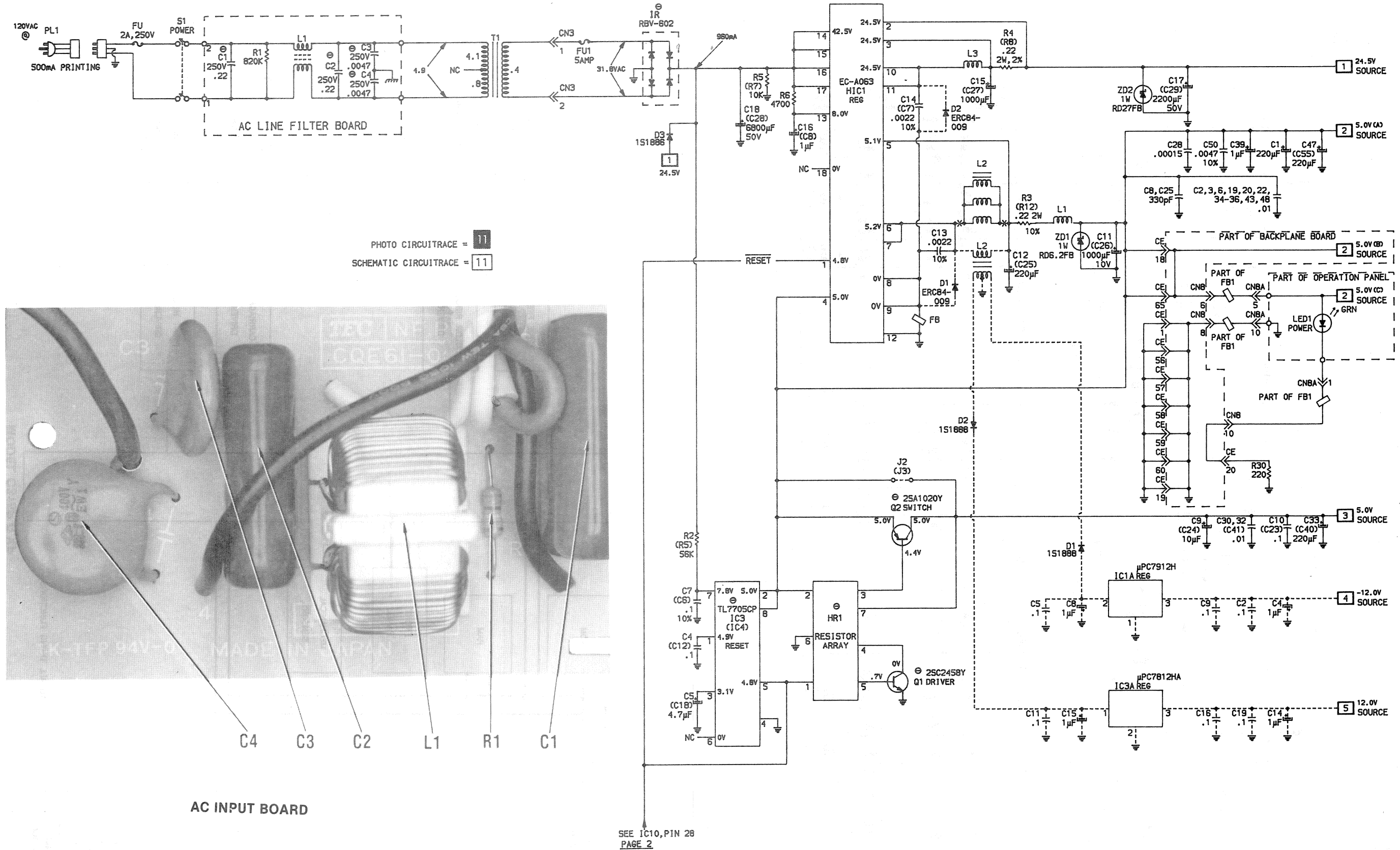


IC PINOUTS & TERMINAL GUIDES



C.10h
MODEL C315P,R,XP

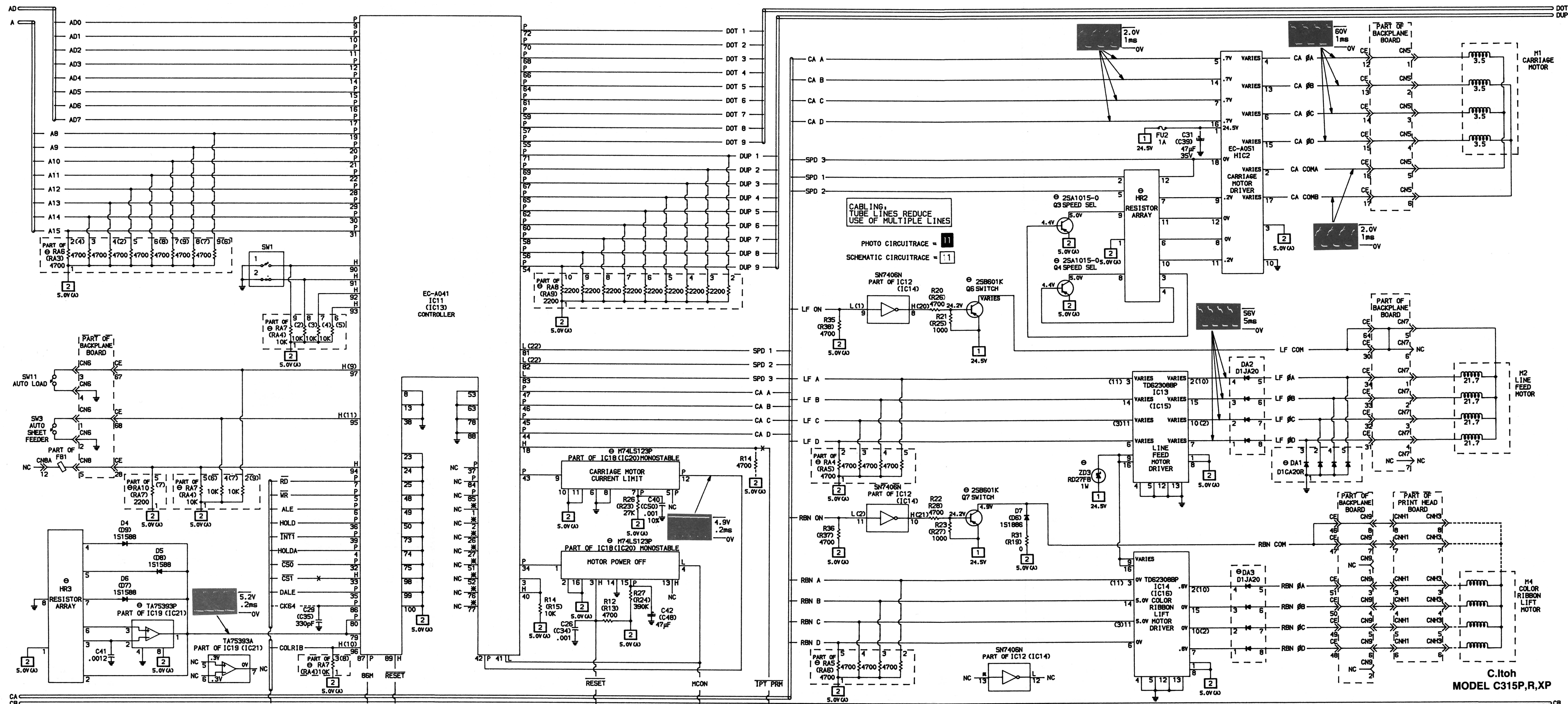
BLOCK DIAGRAM



A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**

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POWER SUPPLY



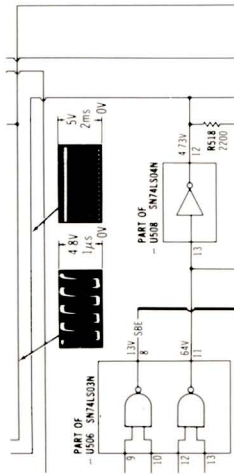
A PHOTOFAC STANDARD NOTATION SCHEMATIC
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COMPUTERFACTS™ put easy to use, informative technical data right at your fingertips. Each edition includes specific service information on the individual component, along with some overall troubleshooting hints.

The following information is just a sample of the many valuable time saving features contained in this exclusive Sams COMPUTERFACTS publication:

- Preliminary Service Checks section is an easy to use, step by step guide for the experienced technician or hobbyist, and even beginners.
- SAMS famous industry accepted standardized notation schematics containing CIRCUITRACE®, GRIDTRACE™, waveforms, voltages and stage identification.

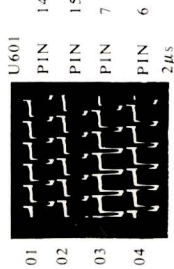


• Step by Step Troubleshooting guides the technician through the necessary procedures to quickly locate the problem.

TROUBLESHOOTING

MICROPROCESSOR CHIP (CPU) OPERATION

Verify the processor is functioning by checking the signals on the address lines (pins 10 thru 24 of IC U600) and the data lines (pins 41 thru 56) using a logic probe or a scope if a logic probe is used, refer to the "Logic Chart" for the correct readings. If a scope is used, the waveforms on the address lines (except pins 22 and 23 which have no signal in Power Up mode) should be similar to Figure 1. The waveforms on the data lines should be similar to Figure 2.



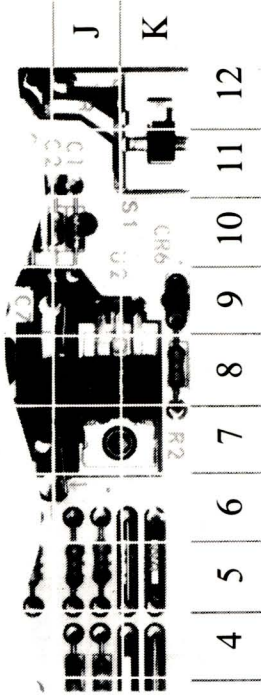
• Logic Chart containing logic probe readings to isolate defective circuitry and components.

LOGIC

PIN NO.	IC U100	PIN 21	IC U100	PIN NO	IC U100	IC U102	IC U103	IC U104	IC U105	IC U106	IC U107	IC U108	IC U109
1	P	P	P	1	L	L	L	L	L	L	L	L	L
2	P	P	P	2	L	L	L	L	L	L	L	L	L
3	P	P	P	3	H	H	H	H	H	H	H	H	H

Remove staples and use cover for file folder.

- Quick Component Location using the SAMS exclusive GRIDTRACE, CIRCUITRACE, and component photographs.



- Complete Components Parts List in an easy to use format with field replacements shown when possible. SAMS unique semiconductor, chip and IC cross-reference gives you many replacements to choose from and is available at your Electronic Distributor.

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. Part No.	ECG Part No.	NTE Part No.	RCA Part No.	ZENITH Part No.	NOTES
D102	1SS53	1149-2576	ECG519	NTE519	SK9091/177	103-131	
D103	2N60FM	1149-2527	ECG109	NTE109	SK3088	103-Z9001	
D201	1N4004GP	1201-4205	ECG116	NTE116	SK3312	212-76-02	
D501 thru D503	1SS53	1149-2576	ECG519	NTE519	SK9091/177	103-131	

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